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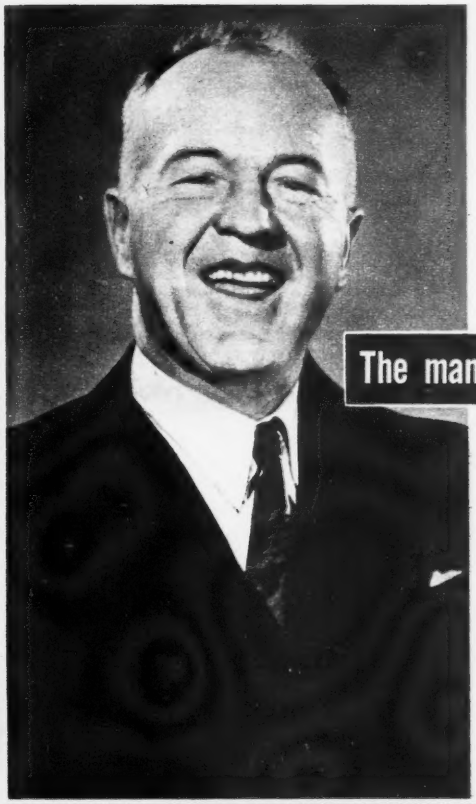

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SPECIAL FEATURES . . .

Paradise On A Shoestring 63
By Harry Kursh

New In Science 68

Cold Facts On Keeping Warm 70
By Lester David

On The Cover: Biggest Baby Railroad 74

Money-Making Idea: They Keep TV Rolling 76
By Kirk Polking

Prize Gadget: Auto-Gard 79

New For The Home 80

Outo Racing On Ice 81

McCahill Drives The French Renault .. 82

MI Tests The '52 Lincoln 86
By Tom McCahill

Pin-Up Car 90

New For The Road 91

Honkers Away! 92
By Raymond R. Camp

MI's Old Car Contest 96

Hobby Hall Of Fame: Ronald Reagan .. 98

Snow Business Is Good 99

Skeletons, Shrunken Heads and Butterflies 100
By H. W. Kellick

Editor's Workbench 14

Invention Clinic 20

Dear Editor 34

continued on page 10

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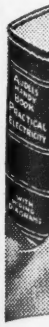

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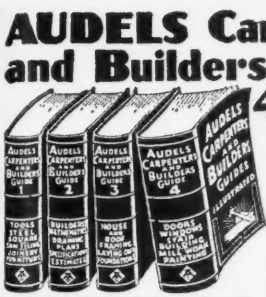

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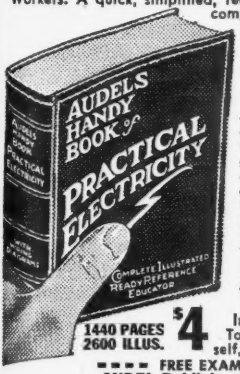

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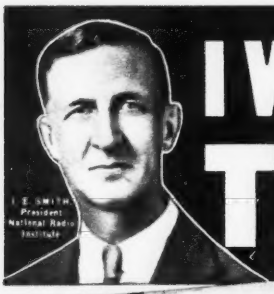

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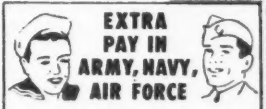

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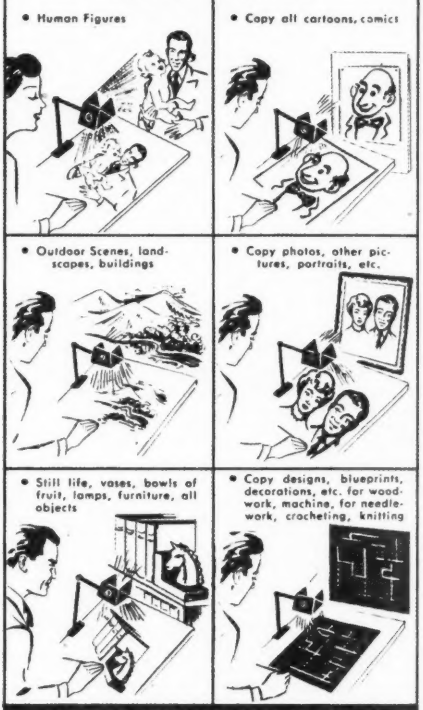

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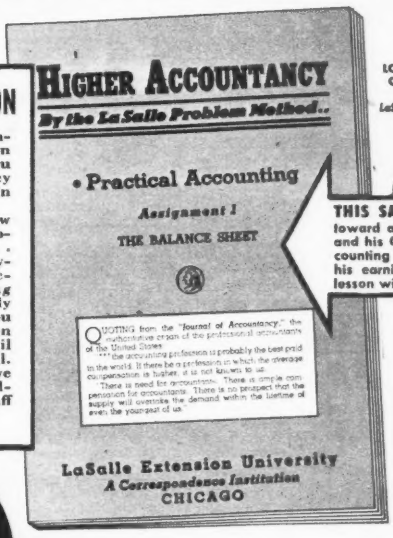

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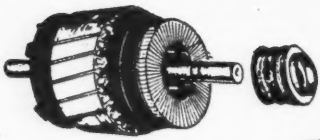

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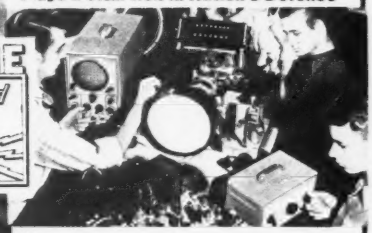

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continued from page 2

Bedroom Chest 105
The Portable Belt Sander 106
Early American Desk 110
Weekend Projects 114
Craftsman's Corner 116
Build The PBY Catalina 118
Workbench Award Winners 122
Special Paints 124
Wall Desk 129
Car Care 130
Polliwog—18-Ft. Auxiliary 132
Around The House 138
Model Maker's Roundhouse 140
New For The Shop 142
Monthly Photo Contest 143
Darkroom Kinks 144
Lightweight Flash 145
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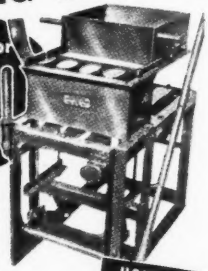

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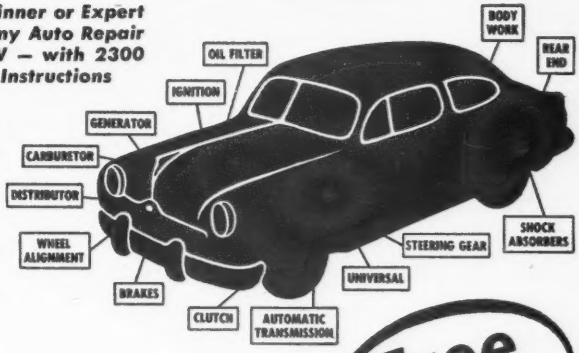

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The Editor's Workbench

That gorgeous station wagon is a '52 Nash Rambler, top prize in MI's Old Car Contest (see pages 96-97). But what is the breed of that luxurious horseless buggy? See text below.

This, That and The Other

As I was saying here last month when I was so rudely interrupted by the bottom of the page, there's a big deal brewing for youse MI guys in the March issue of (y)our very favorite magazine. A chance to win a brand-new 1952 Nash Rambler station wagon for free! Or maybe I should say, for having fun. And that is just what you will have when you enter the colossal, gigantic, super-wonderful MI Old Car Contest next month. The main idea of the contest is to see if you can identify some of the famous old-time automobiles that made American history. Like that 1902 Rambler hossless carriage up above, gently nuzzling its modern Nash Rambler grandson which is, by gum, the very same kind of a dream wagon some lucky lad is going to win for putting the right names under the right pictures of some other old cars like the historical Rambler. It's the kind of a contest you'll go nuts about if you have the slightest interest in automobiles. You don't have to be a grease monkey or a hot rod jockey or an old pappy guy with long white whiskers and a longer memory, to run off with the '52 Rambler or a nice share of the $500 in cash prizes. Best of all, you don't have to buy a lot of junk you don't want just to pay your way into the contest. You don't have to buy *anything*—except next month's issue of MI, which you were going to buy anyway, no doubt. This contest of ours is strictly beaucoup fun and absolutely fair, with no catches and no trick gimmicks. In short, you've got nothing to lose and a lot to win and if you don't go into it you're crazy. So, go into it, hear? MI's Old Car Contest. In March MI. . . As we are off on the subject of automobubbles again (maybe I ought to call this department The Editor's Garage) I would call attention to the fact that the let's-go-faster boys are revving it up anon on the sands of Daytona Beach, Florida, from February 3 through 10, in NASCAR's annual Speed Week. Last year, as you know, Uncle Tom McCahill won the 1951 strictly stock car speed-trial championship by running a V-8 Chrysler New Yorker through the one-mile trap, two ways, at an average of 100.13 mph. This year I'm not sure myself, right now, just what our curly-headed Champ is going to do in the way of defending his title. But I know he's going to be there. And I know that if he's there, he'll want to race. And if he races—well, I don't want to jinx him with any predictions But. . . And speaking of the let's-go-faster boys, it's funny how that speed stuff rubs off on you. It's like the measles. Hang around somebody that's got it and before long you'll be busting out with a rash yourself. Latest victim I know about is myself. Got a date with a speed shop. Gonna get exhaust headers and dual pipes put on my Super 88 Olds. I probably won't drive any faster than I do right now—but it'll be awful nice to know that I could go a coupla miles quicker if I wanted to. And it'll make me think I'm a big shot, hearing the genteel chuckle of those two exhausts, a tone like (as Uncle Tom would put it) the lazy snores of a hibernating bear. . . Far nicer than the angry clamor of impatient auto horns that agitate your ulcers in a city like this. Wish they'd ban horns by law. Think I'll put a cow bell on my car. See you next month.—*Bill Parker.*

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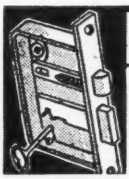

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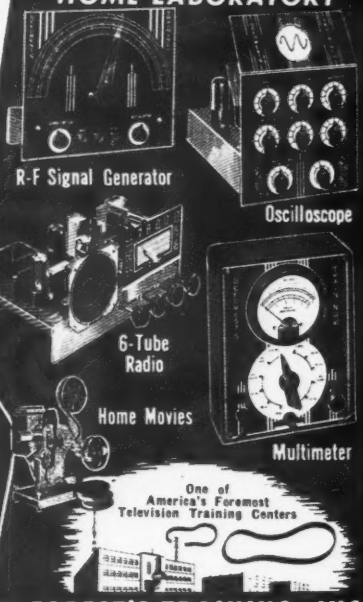

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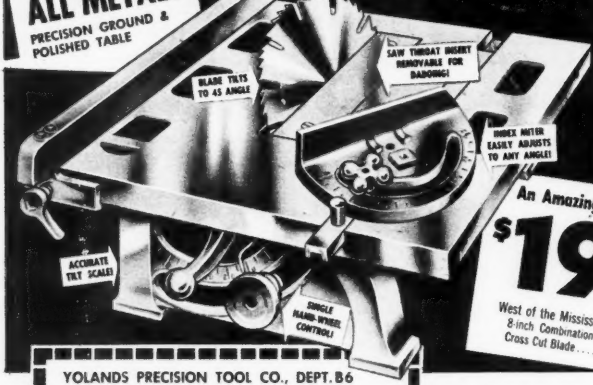

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Invention Clinic

JOSEPH H. KRAUS

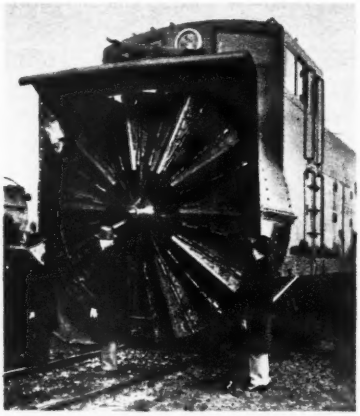
Snow Removers

REMOVAL of snow from walks and roads probably is one of the most difficult problems and one for which no completely satisfactory solution has as yet been developed. This applies both to systems for use around the average home and for large-scale operations on traffic and railroads.

Many inventors have felt that snow can be disposed of easily. The reasoning seems to be that a snowflake melts quickly, so it merely becomes a matter of taking care of a lot of snowflakes at one time. But the winter horror of being snowbound is still with us in all its glory. Obviously, the answer has been too long in coming.

"Under ordinary conditions," states the patent granted in 1901 to Fred W. and Henry S. Farquhar, "snow occupies space enormously disproportionate to the amount of water involved in its formation and consequently its bulk renders its removal slow and expensive."

This statement represents but a small portion of the factors involved. Snow has a remarkable insulation value because within its bulk many air spaces are trapped. Both animals and humans have learned to make use of this property, the former by burrows, the latter by snow houses. The insulation factor is essential to the life of some members of the plant kingdom as well. Yet, this same insulation value makes difficult its successful removal by the common methods of heat application.



Snow plows can get big and complicated. This 1,500-horsepower Lima-Hamilton unit for the Union Pacific weighs 297,000 lbs.

Also of prime importance is the matter of economics of the situation. This applies equally to an individual home owner or a municipality. In areas where large amounts of snow are normally expected it is sound to spend considerable sums to keep roads clear through the aid of special machinery. Where only occasional heavy snows are likely to be encountered, it is economically better for the snow removal systems to be in the form of attachments to sanitation trucks. Of course, if a system could be developed which would be inexpensive, would present no great storage problem, could be effective without employing too much manpower, this might be even more desirable.

On the other hand the immediate costs of operation are of little importance to the home owner. In many areas the local regulations stipulate that he must remove the snow and ice from his walks. For this he rarely calculates the costs of the immediate job. But he does weigh carefully the original investment, the problem of storage and the factor of safety. He would not object, for example, to the considerable costs of heating the concrete walks and drives electrically or otherwise if the costs of installation of the system could be kept well within means and the life expectancy would be great.

[*Continued on page* 22]

INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

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Invention Clinic

[*Continued from page* 20]

Undoubtedly, the best system would appear to be an electrical device which could be manipulated from indoors, or a chemical which could be applied to do a good melting job yet not be detrimental to grass and other plantings. So far neither of these methods seem to have been developed.

The entire field of snow removers for use at home seems to be wide open to the inventors, but it would be well if they examined closely some of the items already protected. And they should test their own models in actual trials under a variety of natural conditions.

After reviewing the many patents which have been granted for devices in this field, one can detect a basic sameness. Either the snow is melted and the water is allowed to run off or the material is compacted and carted away. Everything from industrial gas to a rotary jet has been specified for melting. All

[*Continued on page* 24]

INVENTORS

Before you make any effort to market your invention, you should take the first steps toward proceeding for patent protection.

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[*Continued from page 22*]

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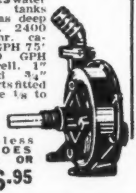

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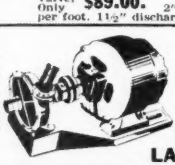

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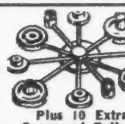

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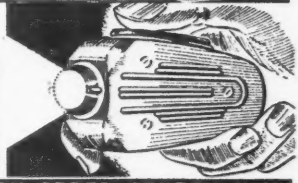

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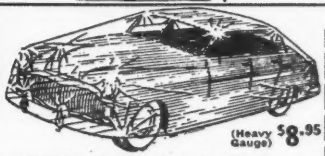

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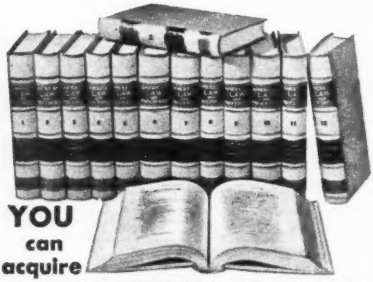

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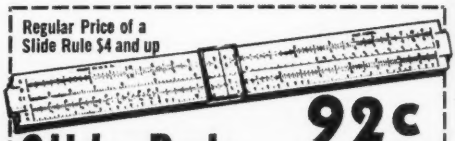

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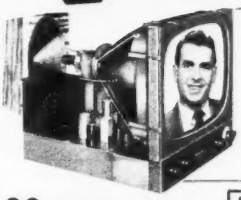

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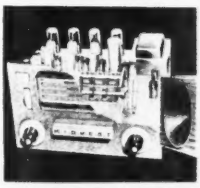

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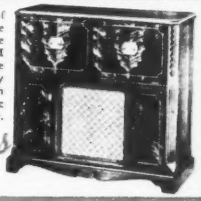

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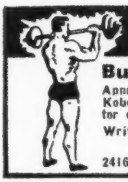

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"Have developed a full inch and three-quarters on my chest, and one inch on my arm. My skin is clearing up." —H. J., Calif.

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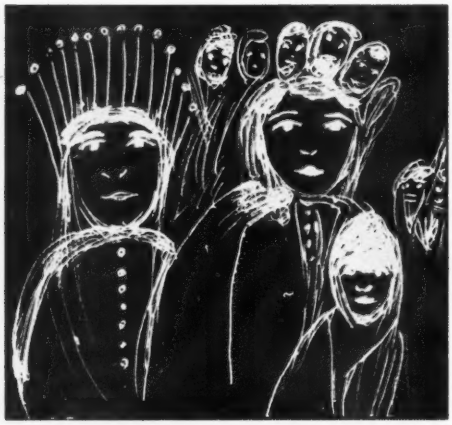
Dear Editor—

Use this letters column as you see fit—make it a complaint box, question box, suggestion box or even a soap box. But use it! Our only requirement is that you sign your name and keep 'em short, interesting and clean. Address mail to: MECHANIX ILLUSTRATED, Letters Editor, 67 West 44th Street, New York 18, N. Y.

American Spirits?

I read with interest America's Spooks (Nov. '51, page 96) because I have had very unusual experiences myself.

Three years ago, I began to see faces and forms materialize on the walls of my home. The gift of drawing was given to me, too, and I find I can draw beautiful portraits of these visions, portraits which cannot be told from



human faces. Enclosed are some spirit faces as they appeared on my wall.

I am now going to put this before the world.

Mrs. Georgia Mosher
Syracuse, N. Y.

No Pages; No Kicks

I am the possessor of a rare issue of MECHANIX ILLUSTRATED. In my November issue, pages 145-160 were missing. Who knows, it may be worth thousands some day.

C. Schoengrund
Kalispell, Mont.

We save more *money on paper that way. . .*

Sportsmen On Wheels

Tom McCahill's Sportsman's Dream Car (Dec. '51, page 76) is really a dreamboat. Please send me more detailed plans and I'll build it. Also, please send me the money.

James Brion Younghirt
New York, N. Y.

Sportsmen all over the country are probably drooling over Tom's car. Well, back to my old Ford.

Arthur K. Bregger
St. Louis, Mo.

I am quite sure that in the next few weeks all of America's true, red-blooded hunters will be flocking to their nearest Cadillac dealer to purchase this $20,000 monstrosity.

Would you like to have my plan—a rocket ship just right for Sunday afternoon cruises to Venus or Mars.

Charles Stovall
Monroe, La.

Return Of The Thing

What is the thing under the motor of my auto? I've got a 50c bet on this question, so please help me.

R. Isaksen
Buskirk, N. Y.

We dunno. Could it be a body?

Hot Rod Demand

I thought your hot rod-sports car (The MI Sportster, Nov. '51, page 106) was great. There's an awful lot of interest in hot rods so how about more stuff on them?

J. D. Saligant
Montreal, Can.

The editors of MI have been watching the growing interest in hot rods and we intend to keep covering the field. However, we are also publishing a 25-cent book called *Best Hot Rods* which will give you all the latest dope on the hop-up craze. It'll be on your newsstand about the end of February.

Yours for the asking—
No charge—no obligation

"How to Become a Mail Order Millionaire"

Read how Gilbert on a "peanut" investment built up to $350.00 A DAY. Learn how Zimmerman started a mail order business on a buck private's pay and spiraled $16.80 into a big yearly income. See how a Chicago clerk quit a $75.00 job and now makes $22,000 a year in his own Mail Order business. Read how a southern boy made a fortune selling war-surplus parachutes which he bought as he went along. All Free! Send name on coupon for a copy of this fascinating reprint of "How to Become a Mail Order Millionaire" from Mechanix Illustrated plus details on the L.W. Mail Order Survey.

Start on a SHOESTRING!

The real-life stories of success in Mail Order read like fairy tales. If I had not personally known these people their stories would be hard to believe. Yet they are not only true, but they represent just a few of the hundreds of "little operators" who have been swept into big money by Mail Order.

GAINES. I personally guided his start when he invented an automatic pants presser. He started with one little ad in one magazine. Four years later he retired — with enough real estate to keep him in cash income the rest of his life.

VAN MARK. I worked with him for six years. I met him when he was a wagon man for a tea and coffee house, knocking on doors. He went into Mail Order on nothing—made money from the start —ended up six years later with savings of $50,000 and an income of $5000.00 a year for life without further work.

DUGGAN. A few years ago he was a truck driver. Started fooling with Mail Order in a spare room in his spare time. Last year he said, "I don't know how much I'm worth—after you get the first million you quit keeping track."

MRS. NIXON. Started a small Mail Order business at home—just to keep occupied. It looked good and she came to me for advice. I showed her how to expand. In two years the business got so big her husband resigned his job to help manage it.

FOXMAN. Foxman worked as a hack writer at $70 a week. He had idle time in the evenings—ran an ad offering something he didn't have—got so many orders he had to find a source of supply. He made $18,000 the first year. He gives me credit for "showing the way."

JORGENSON. Consulted me about a specialty product. On my advice he ran one ad to "test" its saleability. That ad brought sales of $50,000. In his first year he did a business of nearly a half million dollars. His original investment was less than a thousand.

These things I have seen. These people I have helped to the realization of their dreams — these and hundreds of others. My own fortune was made in Mail Order. And now my secrets can be yours.

L. W.

Have you ever thought of running a profitable little sideline right from your home? Has it occurred to you that *you are just as capable as anyone else* of making money on a product or service that can be sold by mail? Have you ever looked into the Mail Order business as it's run (on tiny investments) by innumerable small operators?

Forget about Sears and Ward's! *Read about the "little fellows"* . . . clerks, teachers, vets, mechanics, salesmen and others . . . who are packing Mail Order items in bedrooms, spare rooms, attics, garages, cellars . . . dumping them in the Post Office . . . and quietly banking the fistful of Money Orders, cash and checks delivered to them daily by the mailman.

An annual business of almost a billion dollars is done by "little fellows" who advertise and sell *just one item!* The Department of Commerce of the United States says, "A number of the most successful obtain incomes as high as $40,000 to $50,000.00."

It's an incredible story . . . a story of a business that's wide-open for newcomers . . . with opportunities for income far-and-away greater than you can ordinarily hope to attain by holding down a job. And in Mail Order you can stay as small as you wish—run your deal as a $50 or $75 weekly sideline—or consider jacking it up into really big figures as a full time operation.

Glance at the examples at left. *These true stories are far from unusual.* Multiply them by the hundreds and you begin to get an idea of what can be done . . . what *is* being done . . . in the phenomenal Mail Order field.

• • •

Yet, if you were to jump blindly into Mail Order your chances would be slim. A peculiar brand of "know-how" is vital in this little - known, little - understood business. *This is fortunate for you.* If any Tom, Dick, or Harry would "click" in Mail Order, the field would have been overloaded years ago.

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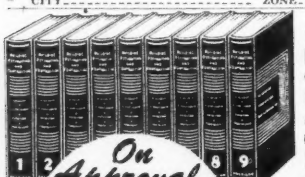

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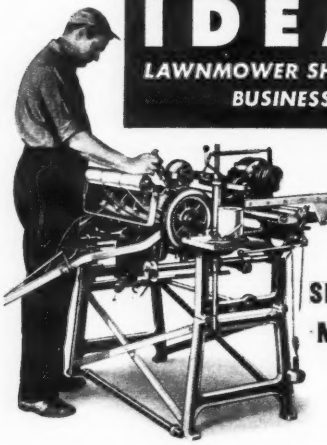

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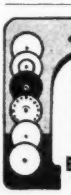

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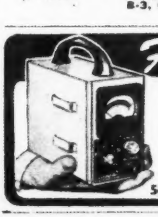

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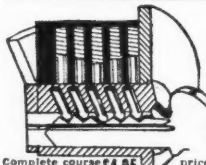

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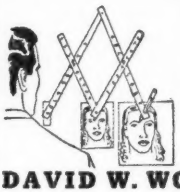

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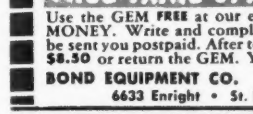

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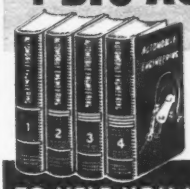

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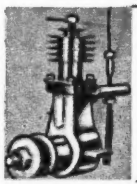

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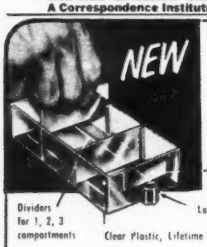

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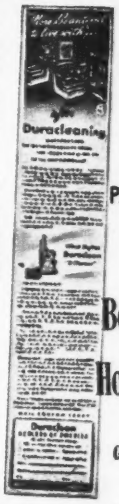

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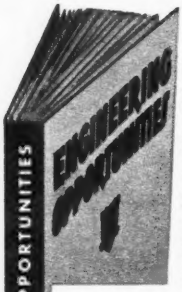

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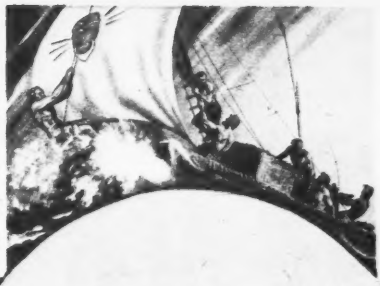

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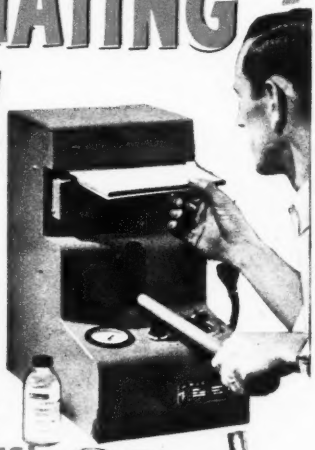

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WARNER ELECTRIC CO.,
1512 Jarvis, Dept. 6-B Chicago 26, Illinois

Thousands of Beautiful Art Creations

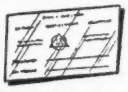
No one yet has been able to list the thousands of gorgeous articles that can be made by Laminating as explained in our Free Information. Just a few are

COSTUME JEWELRY—CIGARETTE BOXES—JEWEL CASES—GLOVE AND HANDKERCHIEF BOXES—CUFF LINKS—NOVELTY BUTTONS—TRAY—CANDLESTICKS—COASTERS—CLOCK CASES—LAMP BASES PICTURE FRAMES—BOOK ENDS—PAPER KNIVES—KEY CHAIN CHARMS—CHECKERS—CHESSMEN—ADVERTISING SIGNS—NAME-PLATES—BOOKMARKS—BELT BUCKLES—TIE RACKS—KEEP-SAKES OF ALL KINDS.

$5-$10-and $20 BILLS COME TO YOU IN THE MAIL

By our MAGIC MAIL Plan you sit at home, send out mail, and get back money and orders. Additional profits in supplying local people with lifetime protection for

SNAPSHOTS—IDENTIFICATION CARDS—DISCHARGE PAPERS—DRIVERS' LICENSES—SOCIAL SECURITY CARDS—VOTERS REG. CARDS—MENUS—BIRTH CERTIFICATES—CREDIT CARDS—BIRTH AND WEDDING ANNOUNCEMENTS—RAILROAD PASSES—IMPORTANT DOCUMENTS OF ALL KINDS.



Lifetime protection. See how laminating protects against wear, soiling, and moisture damage with its smooth, flexible, plastic covering on each side. LIFE-TIME PROTECTION needed for valuable or sentimental objects of all kinds—even a priceless whisp of hair can be laminated. Think of the countless thousands of profit items for your Laminating Press

WARNER ELECTRIC CO. Dept. 6-B
1512 Jarvis, Chicago 26, Illinois

Rush complete information with illustrations showing the things I can make and the money possibilities in Plastic Laminating. All this is free. I do not pay a penny now or at any other time. No salesman is to call. Send all facts by prepaid mail. Be sure to tell me how I get orders and money from my Postman by your MAGIC MAIL Plan.

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ADDRESS _____

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Your advertisement can reach this mail-buying audience of multi-million readers for only 80c per word . . . payable in advance . . . minimum 10 words. Copy to be inserted in April issue must be in the office February 1. Mail to MECHANIX ILLUSTRATED, 67 West 44th Street, New York 18, N. Y. Word count: Zone number free. Figure one word: Name of state (New Jersey); name of city (New York); sets of characters as in key (14-D); also abbreviations as 35MM, 8x10, D.C. A.C.

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NEED MONEY? $50-$100 and more is yours—easily, pleasantly, quickly. In spare time just show friends irresistible Elmira assortments of all-occasion greeting cards, wrappings, personalized stationery, napkins, matches, many other exclusive, profitable specialties. No investment. No experience. Success assured. Bonus. Special Prizes. Promptest Service. Write Today. Free samples, assortments on approval. Elmira Greeting Card Co., Elmira 107, N. Y.

MAKE MONEY Calling On Friends. Show nationally advertised Greeting Cards —new All-Occasion Assortment and laugh-packed Barrel-of-Fun. Also sensational Pinafores & Parasols Personal Notes. All three dollar sellers. Up to 50c profit for you. Big line, includes Gift Wrappings, Stationery, Gift Items, etc. Get Three assortments on approval. Write Wallace Brown, 225 Fifth Ave., Dept. H-4, New York 10.

LOOK! EXTRA Money for vacations, unpaid bills, savings, charities. Sell friends Greeting Cards, Gift Wrappings, Gifts. Experience unnecessary. Big Profits. Bonus. Surprise Gift Offers. Request Feature All-Occasion assortments on approval, Free samples Name Imprinted Stationery, Napkins, Towels and Free Catalog. New England Art Publishers, North Abington 605-B, Mass.

SELL SUNSHINE Exclusive Everyday Cards and make Big Money the easy friendly Sunshine way. Complete selection greeting cards, stationery, gift wraps, novelties, etc. 21 Deluxe Miniature Everyday cards—75c. Many others. Send postcard today for your Sunshine Sample Kit on approval to: Sunshine Art Studios, Dept. MI-2, 115 Fulton St., New York 38, N. Y.

ALL-OCCASION GREETING Cards that are such terrific sellers all you have to do is show them. 21 boxed sell for 1.00. Over 100 other wonderful boxes including Birthday, Get-Well, etc. Profits to 100% plus bonus. Write for free samples. Kit on approval. Regal Greeting Card Co., Dept. 68, Ferndale, Mich.

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MAKE MONEY Fast—Sell big value Greeting Cards. Four new 21 card $1.00 All-Occasion Assortments, Birthday, Easter, Novelty cards. Gift Wrappings, Stationery, Notes. Unusual Gift Items. Over 100 fast-sellers. Amazing profits. Write for Samples on Approval and "Get-Started" plan. Hedenkamp, 361 Broadway, Dept. MI-14, N. Y.

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MEN! YOU can make a fortune if you join us now. We are introducing Kantlash. Greatest fishing equipment accessory ever manufactured. Sales already pouring in. We want distributors immediately! Retails $2.95. Big, easy profits. Write today! Kantlash, Evanston 10, Ill.

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SCHOOL SENIORS! A postal will bring you our wonder, Kwick-Sell Cardalog of popular Graduation Name Cards. Biggest profits! Only firm giving free Golden Memory Book & Souvenir Chest. Don't miss out. Hurry that postal! Craftcards, Box 235 (AF), Pittsburgh 30, Penna.

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MAN TO earn $90 week up. Long needed invention. Advertised *Saturday Evening Post, Colliers.* Prospects everywhere. Full or part time. Exclusive. No investment. Free samples. Write Red Comet, Inc., Dept. 14-B, Littleton, Colo.

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BUY WHOLESALE thousands nationally advertised products at big discount. Sent free "The Wholesale Plan." American Buyers' Service, 629-MI Linden, Buffalo, N. Y.

FREE SAMPLES, and amazing plan, giving you gorgeous Dress without penny cost. Rush name today with dress size. Harford, Dept. G-335, Cincinnati 25, Ohio.

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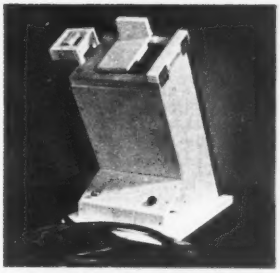

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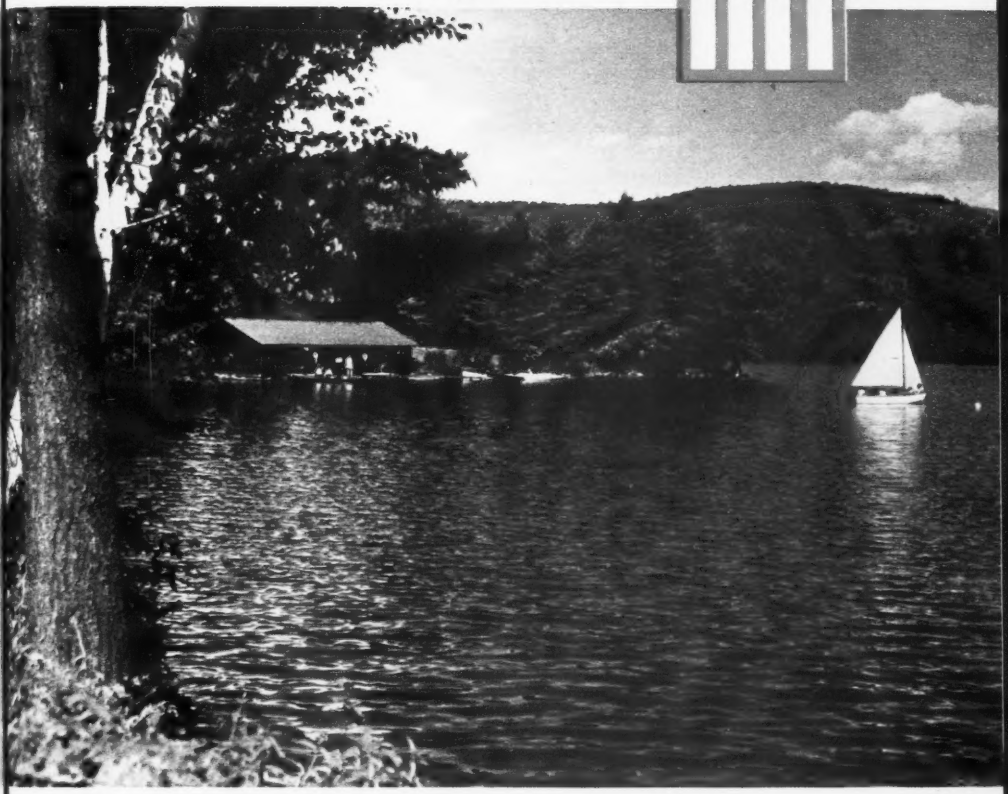


PARADISE *on a shoestring*

Uncle Sam will lease you a home or vacation site for $1 per acre with option to buy.

By Harry Kursh

YOUR own piece of land! It lies alongside a beach. Or it's tucked away in some lush valley, perhaps near a trout-filled brook. And on it is your own little camp—or just a cozy bungalow to get away from it all.

You've undoubtedly thought about such things and heard your friends dream them aloud. But you probably never thought it could come true.

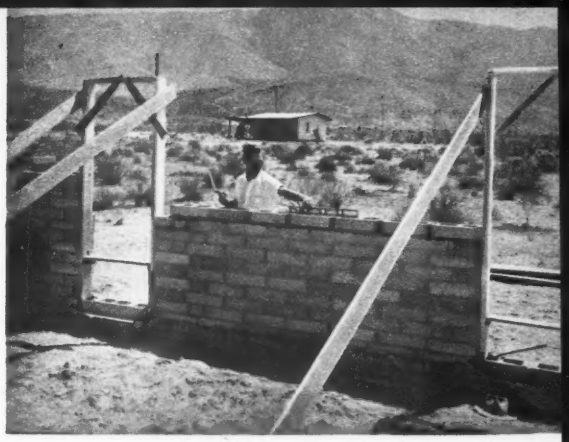
Regional Commissioner Luther Hoffman inspects one of the homes built at Mariana Ranchos in the California desert. House was erected on government land by a concert musician and his son.

Well, if land is the only thing holding you back, here's your chance to stop talking and start acting. Because you now can get as much as five acres of almost any kind of land—on the slope of a rugged mountain, fronting a lake or beach, in a valley or hundreds of miles from nowhere on a desert—for as little as $1 per acre under a renewable lease with option to buy at a fair market price.

Who will be such a beneficent landlord? The United States Government, in case you don't know it, owns approximately one-fourth of all the land area in the country. While most of it is national forest and land leased to cattlemen for grazing rights, there are still hundreds of thousands of acres which, in Uncle Sam's own words, "are suitable as small land tracts for vacation sites or year-round home sites, to serve recreational, health or business purposes."

The United States Bureau of Land Management in the Department of Interior looks after these millions of government-owned acres and is more eager than ever to transfer small land tracts to private hands. The Bureau has a good reason. It wants to concentrate on management of the large land blocks—such as forests, ranges and watersheds—which are of growing importance to the nation for timber, coal, oil, gas and mineral resources.

Nobody knows how many people have already gotten in on the deal with BLM for small land tracts. But out in California you'll find dozens of Hollywoodites, such as actors Ronald Reagan and Cornel Wilde and directors Jean Negulesco and Frank Borzage, already enjoying vacation homes on land acquired from BLM. The Bureau's program, however, is meant for practically anyone. And there's nothing to keep you from reaping the benefits if you're a citizen, at least 21 years of age, or the head of a



Another desert resort home goes up as Gilbert Bernard sets cement blocks in the house he is building for his niece. In the background is the property of the president of the Mariana cooperative.

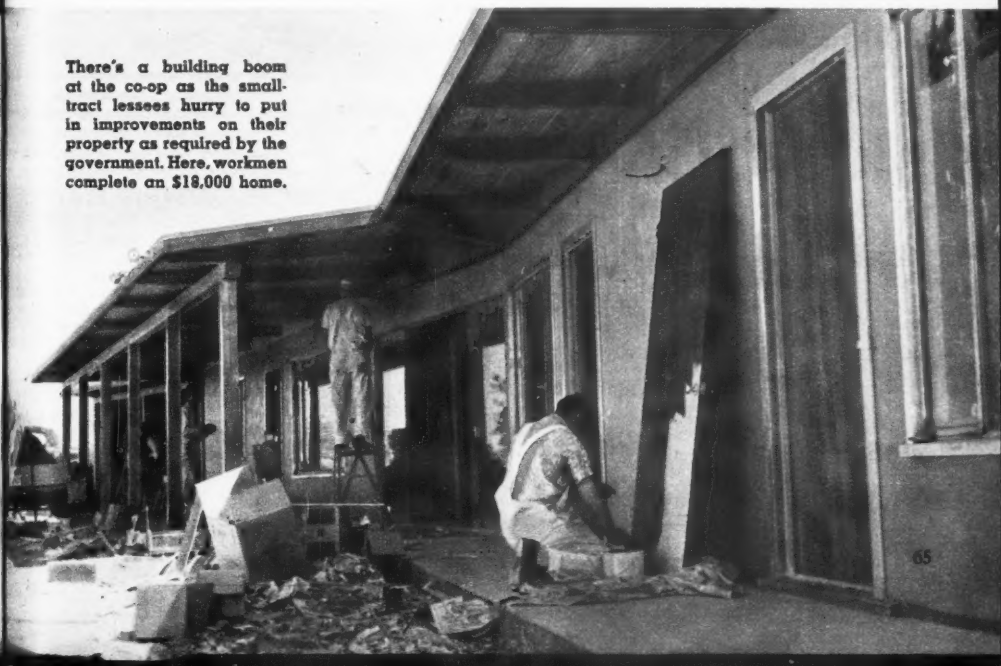
family if you're not yet 21.

Last year Dick and Vivian Helm piled into their '49 Ford and left New York for a honeymoon trip to the West Coast. They had 30 days but the thought of returning to the crowded city with no chance of getting their own apartment didn't exactly add pleasant moments to their trip. Passing through the California desert they rubbed their eyes in disbelief. From almost out of nowhere they came upon Mariana Ranchos, an up-to-date resort community with modern homes, playing fields and even swimming pools. The Helms were amazed to learn that everyone in Mariana Ranchos had built on government land leased originally for a few dollars a year. Yet some of the land was so good that its final selling tag commanded a fair market price of several hundred dollars per acre.

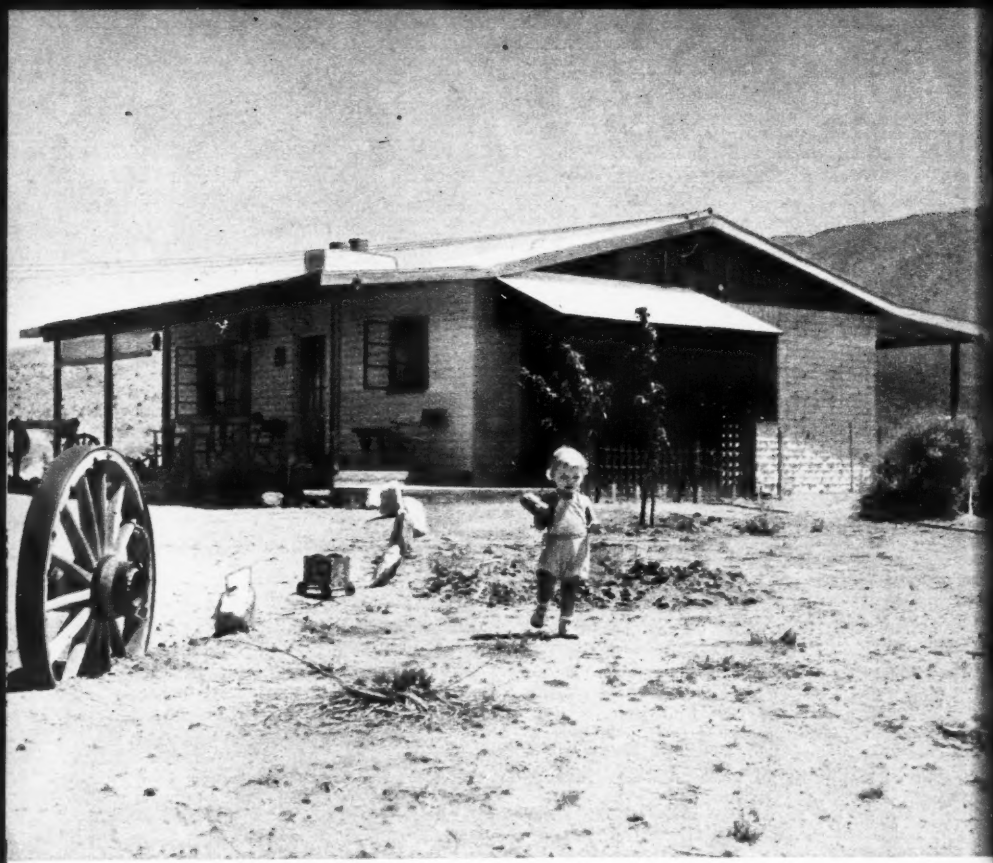
Not wanting to waste time, Dick and Vivian raced over to the Los Angeles land office, got the information they were after and dashed back to the desert. They found a piece of government-owned land they liked less than 40 miles from Los Angeles —but they had to pay a little more rent than the others. Five dollars a year for three acres!

Recently they decided to execute their option to buy and Uncle Sam, following the law, said: "Okay, but first put up your permanent home. That'll show us you are sincere and will take good care of the land." So, Vivian and Dick put up a temporary shack until plans for their permanent five-room ranch house got rolling and soon, they will get their land for the fair market price of $45 for all three acres.

Take the case of a student at Rutgers University in New Jersey. He worked at night and had a part-time fur salesman's



There's a building boom at the co-op as the small-tract lessees hurry to put in improvements on their property as required by the government. Here, workmen complete an $18,000 home.



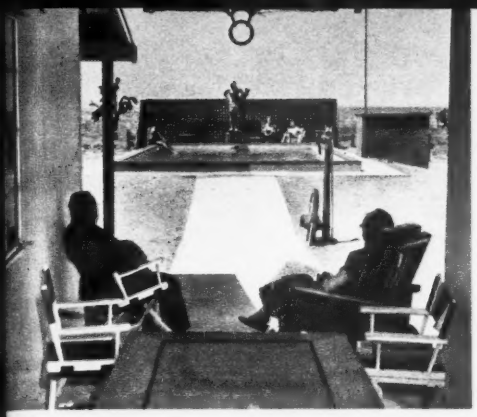
Seventeen-month-old Debbie Bernard, a resident of Mariana Ranchos, toddles in front of the home of her uncle, Drew A. Bernard, executive of the Glendale Chamber of Commerce and one of the prime movers in the desert development 15 miles southeast of Victorville, Calif.

Mariana Ranchos photos from Los Angeles Times.

job. On a trip to Florida last year, he heard about the BLM's small land tract program and put in for 2½ acres in north Florida's Dixie County on the Gulf of Mexico. He signed a standard $5-a-year lease and at the end of his first year, after building his own two-room cinder-block cabin, bought the land for $60. Now, between school terms and job lay-offs he shuttles down to his Florida camp for a week or two of sunshine. His neighbor, with five acres bought from BLM at $145, is an Army Air Force intelligence officer.

Does the fellow like his land? Here's what he wrote recently to the Washington office of the BLM: "The nearby public beach appears to be superior to most other beaches on either the east or west coast of the U. S. It is almost snow white with very smooth sand. And the water is typically Gulf Stream, ranging from sky blue to dark blue in alternating streaks and increases gradually in depth from the beach outward with a smooth white sandy bottom."

While he paid only a price based on what an official appraiser considered fair market value, the land could end up being worth much more. In the student's vicinity, for example, North Florida has become such a popular resort area that two-bedroom concrete-block cottages rent for as much as $100 and $125 per week. Beach-front property on 60-by-120 foot lots ranges from $1,500 to $2,750, while land back from the beach goes for $700 to $1,500 per lot.



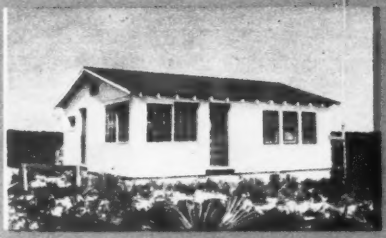
Land commissioner, top left, watches the desert dwellers cavort around their community swimming pool. Above, Mrs. Ella Moe stands in front of a picture window in her homesteading retreat.

Actually, at a slightly greater cost you can get the BLM to lease or sell you land specifically for business purposes. In Alaska, where probably the greatest opportunities exist for the pioneer-minded to get some really choice land, many have found it possible to combine living on scenic land with business opportunities.

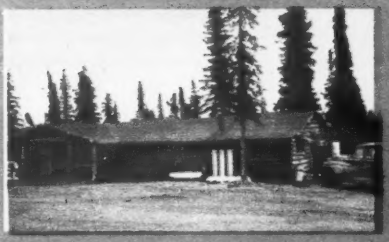
That's what Chuck Sutter and Bill Brown are doing right now. On a trip through Alaska not long ago they came to the conclusion that the things the territory needed greatly were lodges and refreshment stands between towns. They fell in love with a beautiful piece of real estate around a dream lake at the foot of picturesque Tazlina Glacier on the highway between Anchorage and [*Continued on page* 166]

On a small island in Hubbard County, Minn., cabin was built on land acquired from U. S.

Classified as combination home and business, motel is located on Destin, Fla., Highway 98.



Overlooking the Gulf of Mexico near Eglin Field, Fla., is this new BLM vacation home.

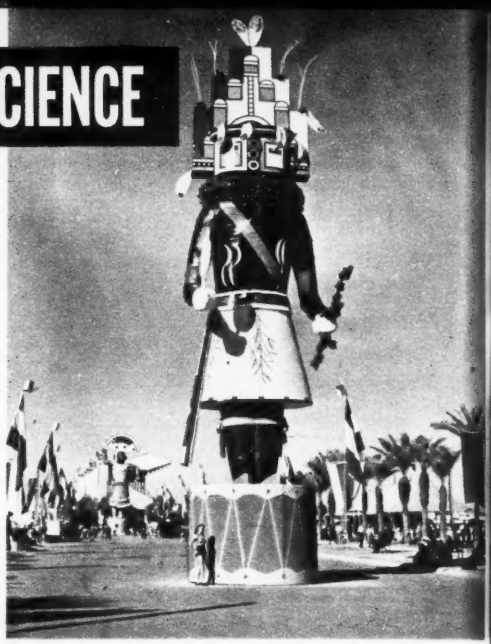


Here's the lodge Chuck Sutter and Bill Brown built at foot of Tazlina Glacier in Alaska.

Land near Port Washington, Fla., on which this cabin is built, was bought from BLM for $50.

NEW in SCIENCE

Garter Buzzer tuned to a transmitter informs the wearer that she is being called on her walkie-talkie. Receiver in model's hand is only slightly larger than a pack of cigarettes but has a range of 12 miles, will be marketed when frequencies are allowed. Hoffman TV and Radio Co., Los Angeles.



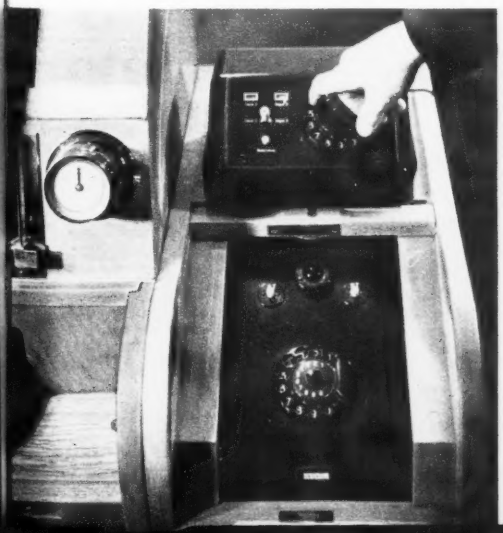
World's Biggest Doll is this Hopi Indian Kachina prepared for the Arizona State Fair in Phoenix. Standing 65 feet high, it completely dwarfs Miss Mary Ann Davis who poses near its drum base. Giant artificial feathers sprout from its headdress.

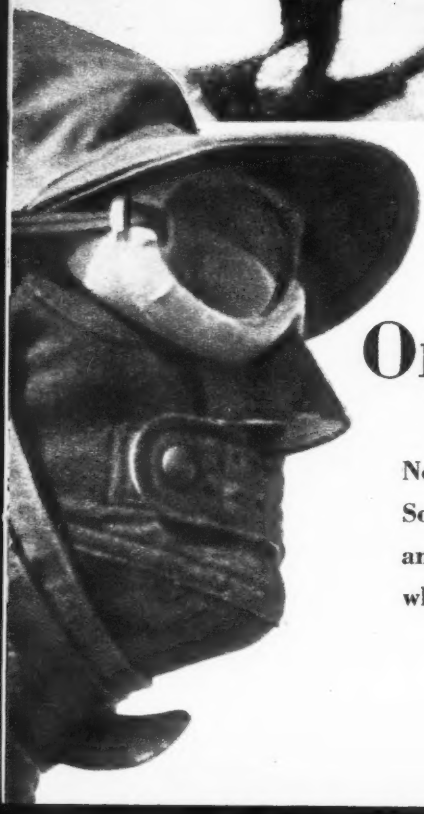
Secret Weapon? No, just a super spotlight projector developed for German Sky Publication Co. in Salzgitter-Bad, Germany to beam advertisements on the night clouds. Called Astralux, it is 36 feet long, weighs 2½ tons and produces 4,500,000 candle power. At an altitude of 16,500 feet an ad covers over 225,000 square feet.

Automatic Life Guard for swimming pools was invented by James Robertson of North Hollywood, Calif. Ripples caused by someone falling into the water of an unattended pool activate a diaphragm in the metal float causing an alarm to ring.

Wind Tunnel Skier is one of British ski team training for the Olympics to be held at Oslo, Norway this year. In the Farnborough Aircraft Tunnel Dr. Donal Garrow bucks an 80 mph headwind, top.

Electric Hotel Guide in Munich, Germany railroad station, right, lists number of rooms and types available in the city's various hotels. Apparatus in each hotel, left, operates like our dial telephone. Room clerk does the posting. Now when a traveler arrives at the station, he can check all hotel vacancies at a single glance.





Cold Facts On Keeping Warm

No need to shiver when the north winds blow. Science has been checking up on Jack Frost and has learned some very startling facts which disprove old theories. Here they are!

By Lester David

Mechanix Illustrated

AMAZED doctors crowded into the emergency ward of the Michael Reese Hospital in Chicago last winter to see an incredible sight. Lying on a cot was Mrs. Dorothy Mae Stevens who had been found in an alley that day as the temperature hovered around 11 degrees below zero. Her entire body was frozen solid as a rock. Her arms and legs were like iron stems, her abdomen was stiff, her jaws locked tight. "Even her eyeballs," said staff surgeon Harold Laufman, "were crystal hard, like two glass beads."

Mrs. Stevens' temperature was 64.4 degrees, far below the point where life could be sustained—yet the astounding fact was that the 23-year-old woman was alive! Doctors set about thawing her out, administered coramine, caffeine, cortisone and plasma. The next morning her temperature had risen to 101, she could see perfectly, her pulse was close to normal and she had feeling in all her limbs.

And she lived! On August 8, six months after she was found, she was discharged from the hospital, both legs amputated below the knees and missing several fingers from both hands. But she lived.

Medical science still isn't sure what saved Mrs. Stevens. Was it the quick freezing by Chicago's intense cold which kept the tissues alive much as rapid freezing preserves foods? Was it the alcohol in her system (doctors said she had been drinking) which may have acted to protect her body much as anti-freeze acts in an automobile?

Last year, more than 400 persons were frozen to death in the U. S. and many thousands of others suffered serious injury due to exposure to cold. Had they known but a few of science's recently discovered tricks on how to keep warm in frigid weather, the tragedies would not have occurred. Mrs. Stevens had a miraculous escape from death. She was very lucky. The rest of us may not be so fortunate and had better

At left, three Navy fliers take a dip among the ice cakes to test new immersion suits. At lower left, science has found that keeping head and face warm is necessary for comfort in sub-zero temperatures.

Some of the new gadgets being tested. Above are electrically-heated inserts for shoes at right. Aviators use them besides electrically-heated flying suits and gloves.

Hand warmer, above, made by Edmund Scientific Corp., Barrington, N. J., uses lighter fluid. Army gauntlet, right, uses wool insert, works at 30 below.

Mrs. Dorothy Stevens was found frozen stiff last Feb. 8 with a body temperature 34 degrees below normal. Even her eyes were solid. She recovered miraculously but lost both feet and parts of both hands. Here she leaves hospital.

Fundamentally, explains Dr. Hoyt Lemons, research director of the Army Quartermaster Corps' environmental protection section, man is a heat-producing machine who must lose heat to the air just as fast as he creates it. In very hot weather, his problem is to get rid of his body heat and it's done primarily by evaporation of perspiration from his skin. But in cold weather, the idea is to prevent the body heat from escaping faster than it is produced.

Warmth given off by the body surrounds you with a layer of still or dead air. If you can keep it there, you'll stay warm; if you cannot, you'll be cold. Therefore the best clothing is simply that which can act as a trap for holding that dead air right where it is.

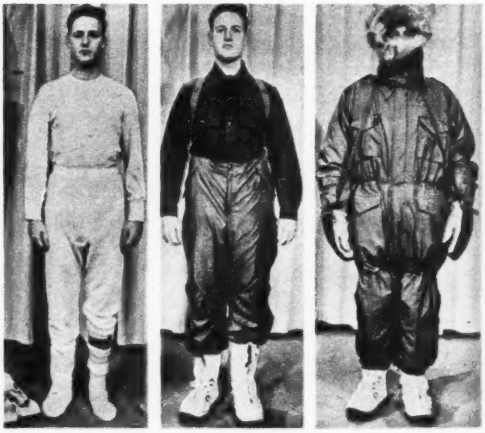
What then are the tricks to stay warm while you're waiting for the bus, buffeting the chill winds or vainly seeking shelter against a building while waiting for your date to show up?

1. Wear a thermally-controlled overcoat instead of a heavy hunk of dead weight. Clothing manufacturers, taking careful note of scientific research, are making them. The secret lies in the variety of linings such as alpaca, shearling, quilting or lightweight wool which do that all-important job of preventing the wind from dislodging the dead-air insulation. Milium, the new metallic lining invented by James Rand III, is composed of aluminum flakes which keep the heat inside by reflecting it back toward the body.

But you don't have to invest in a new overcoat in order to thumb your nose at heed the advice of science. How can you keep warm when the winds bite and the snows swirl around your ears? It's all in knowing how to dress.

You thought, didn't you, that the more you bundled up, the warmer you'd be? Take a tip from the scientific tailors—weight and bulk have little to do with staying comfortable outdoors when the mercury stands at br-r-r. A couple of layers of clothing can be warmer than 20 layers if you wear them correctly.

Clothing research has been going on at a fast clip since the end of World War II and month after month laboratory experts are exploding a lot of cherished notions about dressing for the cold. Here is their theory on how to stay snug and comfortable no matter what the thermometer does.



New winter clothing for Korea has loose woolen underwear and three socks, left; woolen shirt and windproof trousers, center; wool-rubber boots, coat, parka, right

In Icicle Manor, Army's room for cold-testing new devices for its fighting men, GI volunteers give new sleeping bags a try.

the elements. Wear a number of garments, the lightweight ones underneath and over them a thin, tightly-woven coat to keep out the wind. The layer of still air will be trapped between the fabrics.

2. Your feet icy despite the pair of heavy wool socks you're wearing? Then put on *two* pairs, thinner ones of half wool and half cotton, making certain that the outside pair is a trifle larger than the inner one and that your shoes can accommodate another layer of air between them and the socks. The very same principle we've just discussed holds true. The warm air given off by your feet will remain between the socks. If two pairs won't do it, try three pairs of thin ones.

Dr. Joseph Lelyveld, chairman of the National Foot Health Council, declares that podiatrists have found that overprotection of the feet is responsible for an astonishing number of winter colds. A common mistake, he says, is to assume that wrapping feet tightly in stockings and heavy storm gear will furnish adequate protection. Actually, in winter as in summer, feet must be allowed to breathe.

Here are some of Dr. Lelyveld's simple rules.

Never wear rubbers or overshoes indoors. Do not keep them on your feet for extended periods. Always wear sturdy, leather-soled shoes which provide adequate protection at the [*Continued on page* 168]

Meet Chauncey Smythe Depew, the Army's copper GI who tests clothing. Sockets take heat gear.

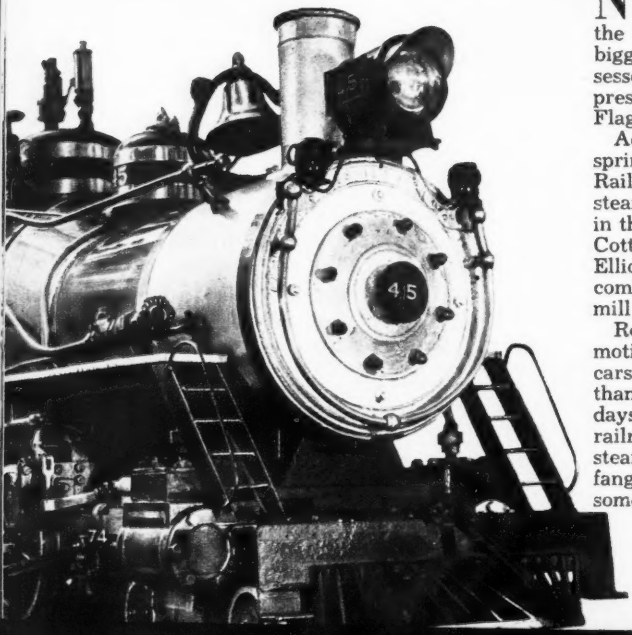
Testing officer checks bulkiness of multi-layered fabric Chauncey wears in constant temp. room.

In winter uniform Chauncey stood atop Mt. Washington three months, gave Army cold data.

COVER STORY

Springmaid engineer waits for Engine 45 to get steamed up before starting on the one-mile park run.

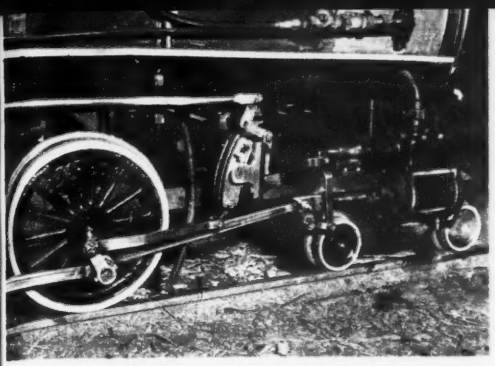
BIGGEST BABY RAILROAD



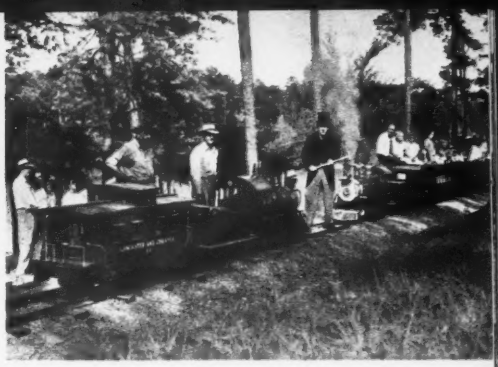
NEAR Lancaster, S. C., you can find the biggest baby railroad in the country. Well, maybe not the biggest in size, but certainly possessor of the biggest list of vice-presidents—from James Montgomery Flagg to Gypsy Rose Lee.

Actually, though, this tiny offspring of the Lancaster and Chester Railway is one of the finest miniature steam railroads in the world. Located in the recreation park of the Springs Cotton Mills, it's the brainchild of Elliott White Springs, World War I combat flier, author, owner of the mill and president of the L & C.

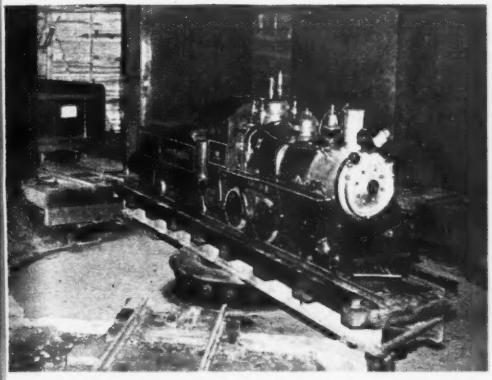
Rolling stock consists of three locomotives, four passenger cars, two flat cars and a caboose. There's more than a mile of track. On their off days, you can usually find oldtime railroaders at the controls of the little steamers. What with those newfangled Diesels, they get sort of lonesome for the huffing and puffing. •



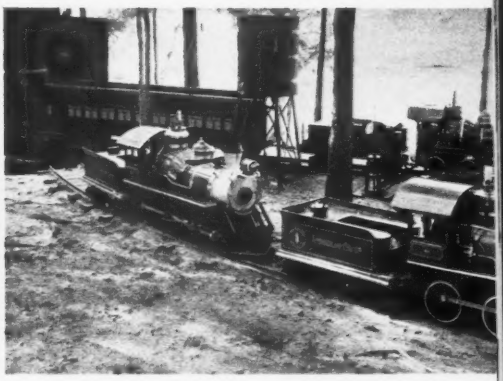
Under the engine's boiler is all the strength of a crack express. Details are so faithfully reproduced they're hard to tell from real thing.



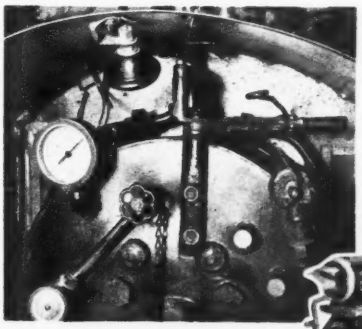
President of the Lancaster and Chester Railway drives a golden spike into the tracks to link the east and west coasts of the recreation-park railroad.

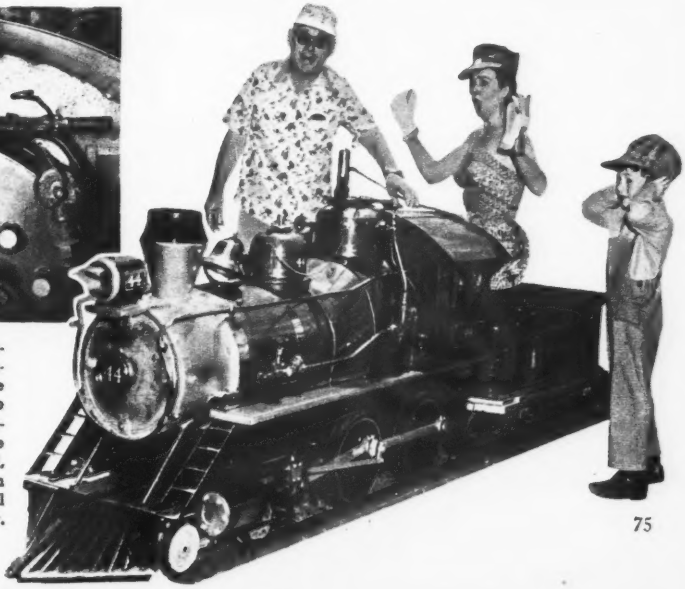


Old 45 swings on a specially designed turntable as it heads for the miniature L & C roundhouse. Cannonballs from Civil War serve as ball bearings.



Yard of this Lilliputian railroad rivals those of regular-sized lines. Note the efficient layout of the switches, water tower and roundhouse.





Gypsy Rose Lee, right, vice-president in charge of unveiling, thought she'd like to be an engineer but she threw up her hands in despair after looking over the complicated control board, above. Genial gentleman assisting her is Colonel Elliott Springs, RR's prexy.

A MONEY-MAKING

Photos by Jim McHale

They Keep TV Rolling

They set up shop in a second-hand trailer and developed their door-to-door repair service into a big business.

By Kirk Polking

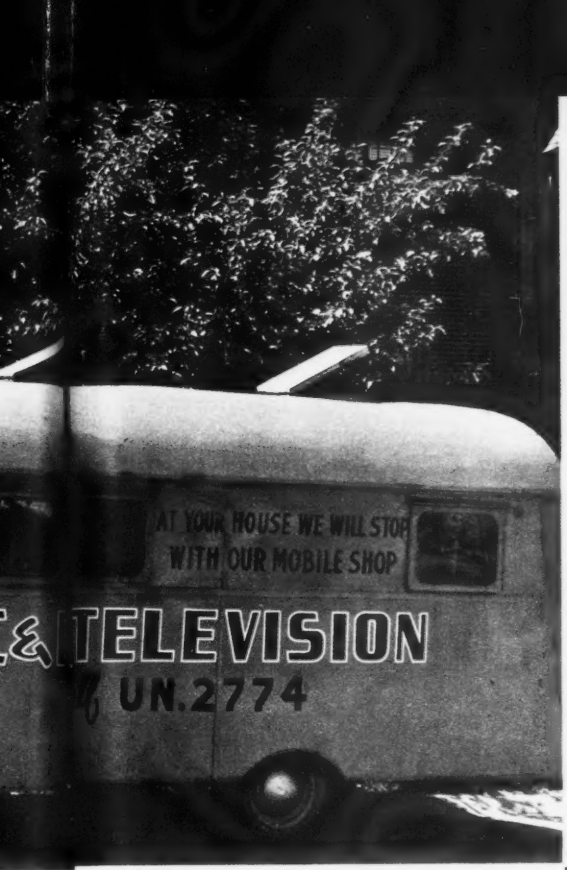
QUICK service! Those are the magic key-words that are making the cash register sing for C & R Television of Cincinnati, Ohio.

There's probably no guy in the world as impatient as the TV addict when his set is on the blink. He wants it fixed—not tomorrow, not this afternoon, but right now! And the repairman who can do it for him is in a position to work up a nice business. So thought Howard Chase and Robert Rosenberg, operators of C & R.

To solve the problem of faster service they decided to put their repair shop on wheels. Finding a trailer at a price they could afford was a real problem. Making the rounds of trailer lots, they looked longingly at 35-foot all-aluminum jobs, but finally settled on a 21-foot Elcar with a roof that badly needed repair.

"It was a pretty sad thing to look at when we bought it," Howard Chase says, "and we spent as much on repairs as we originally paid for it. But it was right for our purposes and we put it into A-1 condition. At least it was cheaper than a new one. We considered models from $500 to $1500."

Through an efficient arrangement of the interior, there is ample room for workbenches and testing equipment, without



they pay for parking the shop at the drive-in. Their telephone calls are taken by an answering service which is operated by a friend, so they have the assurance that each call is being given intelligent, personal attention. Their insurance is covered by a tailor-made policy. Insurance companies have policies for trailers and policies for radio shops but until C & R Television they were never called upon to insure both in one. Their rates are still slightly less than a comparable permanent shop which has a greater cash inventory on hand at all times. C & R does act as agent for new radio equipment but with their setup they do not have to bear the expense of demonstrator floor models and their consequent higher insurance premium.

Gasoline is their major expense. Although by taking their repair shop with them they save a return trip, they get less miles per gallon because they must pull the 1½-ton trailer, so their expenses here are about the same as a regular shop's.

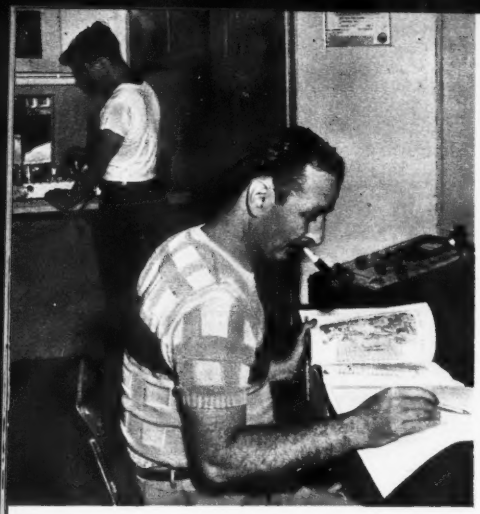
However, compared overall with a permanent shop in a reasonably good location where the expenses would include electricity, heat, telephone, in-

A short time after the customer has called, the trailer shop is at his door. Most repairs take from 15 minutes to a half hour. Power for testing is supplied through an extension cable plugged into the customer's own 110-volt line.

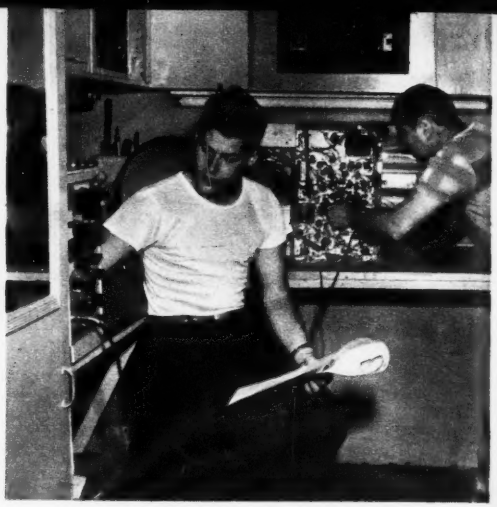
danger of bruised elbows for either partner. Most of the electronic equipment—oscilloscopes, vacuum tube voltmeters, grid-dip meters, etc.—the partners already had. They picked up a sweep signal generator and a supply of standard TV replacement parts, and they were in business with an inventory worth about $1,000.

The next problem was a place to park the trailer when it was not actually on the move. Finally they persuaded the proprietor of a Cincinnati restaurant to let them park the shop at the rear of the drive-in's large parking lot for a very reasonable sum each month.

In addition to quick service, the trailer offers the advantage of low overhead. Their total monthly expenses including rent, electricity, telephone, insurance and gasoline are about $100. Their electricity is included in the slight rental fee



Set diagram is checked by Chase seated at the trailer's desk. Here are stored circuit diagrams for all brands. Tube checker is in background.



Rosenberg checks oscilloscope wave forms against diagrams while Chase makes a wiring repair, rear. Fluorescent lights are noise supressed.

surance, gasoline *plus* a much higher rent, their $100 total monthly expense stands out in sharp contrast.

The majority of the shop's business comes from the individual TV set owner. Cincinnati residents with TV troubles soon discovered that a call to University 2774 brought a quick answer. Within an hour, C & R's mobile shop was rolling into their driveway.

Their average service call takes 15 minutes to a half hour. Only in the case of intermittents, obscure sync problems or the need of a large stock item like a picture tube which they do not carry with them, is it necessary for them to take the set back to home base.

"More than once," Bob Rosenberg reports, "people have called us at ten o'clock on a Saturday night and asked us to come right over to look at a set. They want it fixed for a favorite program that comes on at 11:00. We usually try to answer these requests. It has paid off for us in a lot of new business at a less inconvenient time of day!"

Howard Chase was a Signal Corps radio communications man during the war. He brought himself up-to-date on radio and television maintenance at the New York Technical Institute in Cincinnati, putting in over 2,000 hours after his discharge from the service. Bob Rosenberg has been working with radio as long as he can remember and is an enthusiastic amateur radio fan. Courses in TV have broadened his background on this new phase of radio work.

The partners have put out some direct mail promotion and they plan to enlarge on this idea as one of the most effective means of reaching their audience. As the business grows, newspaper ads of course will get their play too. But the partners feel that the unique, the clever, the unusual approach is their biggest asset at present.

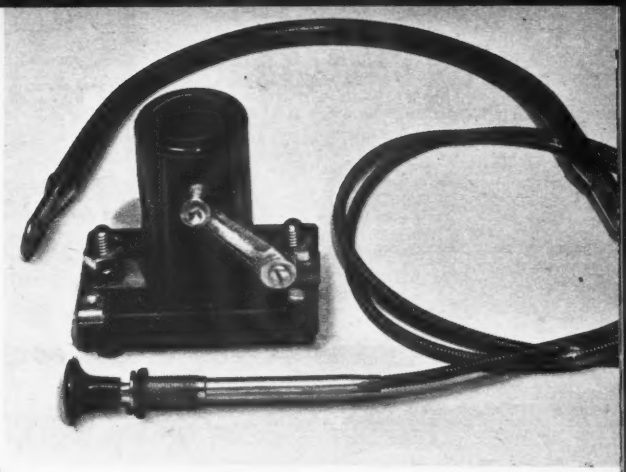
Until now they have had no trouble making their business grow. Within two months after the trailer rolled out to its first call, they were completely out of debt.

The trailer is not without disadvantages; a dead-end street may present a backing and turning problem. And coming down one of Cincinnati's hilly streets in icy weather with a 1½-ton weight behind you is not always the most pleasant driving situation. But the trailer's potentialities have helped make their business grow faster than any other factor could have done.

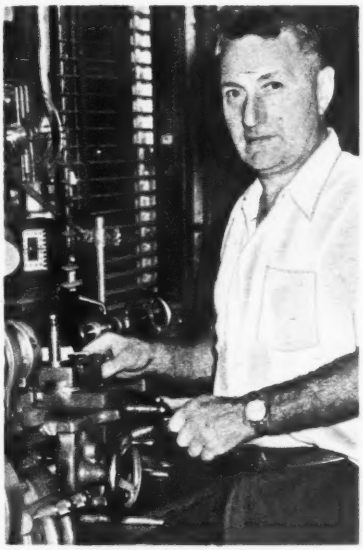
They are thinking now in terms of a small permanent shop in addition to the trailer. Work then could proceed continuously on the bigger jobs while they were making service calls to private homes. And with more and more Cincinnati homes installing TV, Chase and Rosenberg see possibilities in the future for a whole fleet of C & R Repair Shops on wheels. They have found that keeping TV rolling has developed into a very profitable enterprise. •

THIS MONTH'S PRIZE

gadget



Device, right, fastens conveniently under hood. Hand control can be mounted under dash or hidden inside car's glove compartment. Pelletier is shown in his workshop, below, where gadget was born.



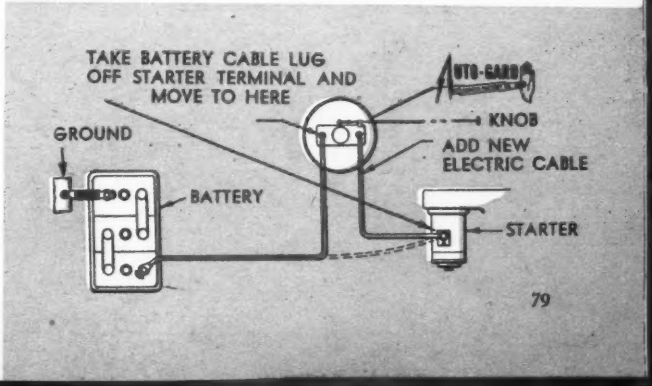
AUTO-GARD: Electric Car-Lock

ROGER Pelletier has been in the automobile business for a long time. When he came to America from France in 1911, he opened a machine shop specializing in hard-to-get parts for foreign cars such as Rolls-Royce, Panhard, Renault and Hispano-Suiza. But his interest wasn't confined to private autos. He became interested in racing cars and raced with the French team, Peugeot, for several years. He built speedboats and won many cups with them at Seafort Harbor. He became interested in flying and got his pilot's license in 1940.

Mr. Pelletier's idea for Auto-Gard came to life when he rescued a man from a burning car. A wrench had caused a short circuit and the fire. He decided then and there that he would make a gadget to prevent auto fires once and for all. And he did. His electric lock cuts off the battery completely when you leave the car, preventing short circuit, battery run-down and theft. •

WIN $50

Dreamed up a neat gadget? If you're pretty keen about that pet project of yours, get busy and work it out in your shop. Then send pictures and a description of your invention to the Gadget Editor, Mechanix Illustrated, 67 West 44th Street, New York 18, N. Y. Each month the best entry will be given a cash prize of $50.



NEW for the HOME

Bucket Seat made of leather with safety cross-strap can be attached to any swing supports and will prevent young noggins from getting bumped. Model for older children, not shown, has no safety strap. Pattison-Forbes, Los Angeles.

Vacuum Wash is a new idea developed for German housewives. After vacuum-cleaning the floors they can hook this gadget to the machine and do the family wash. It utilizes the air pressure from motor. Price there is $8 U. S. money.

Griscer food cutter and salad maker slices, shreds, grates, crumbs and chops with a new-type cone arrangement which operates more efficiently than the old-fashioned flat cutter. Supplied with stand and three different cones. Griscer, Dallas, Tex.

Rippling Rubber for under-rug cushioning has 384 arches per sq. ft. These capture air bubbles which soften each step and save rug wear. In tests 50 rollings with a 12-ton steam roller had no ill effects on it. Sponge Rubber Products, Shelton, Conn.

auto racing on ICE

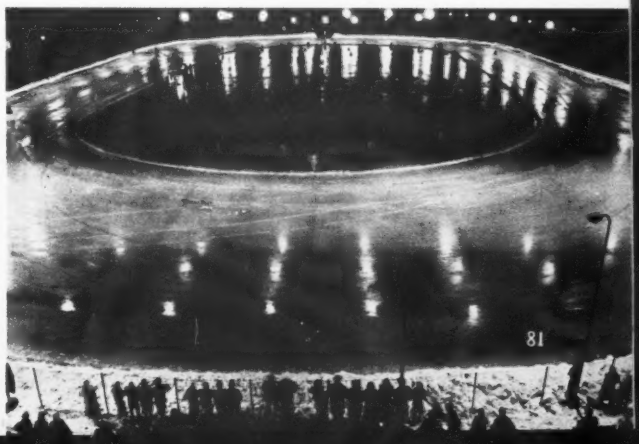
It's tough to see the cars because of flying spray in this race held on a frozen lake at Flaten Beach, a popular summer bathing resort, but they're really burning up the track. Note spiked wheels in the Swedish midget car inset at left.

IT'S tough enough on a dry track and practically suicide on a wet one—but the Swedes go it one better. They like a track that's icy!

For 20 years ice-track racing has been a major sport in Sweden second only to ice hockey in popularity. Hundreds of meets are held each year on special courses which are flooded and frozen, as well as on that country's innumerable lakes. Cars used are M.G.'s, Citroens and Swedish Effyhs which are similar to the British Cooper and their speeds frequently average 60 mph. A real hazard to their drivers is the possibility of ice formation on the windshield or goggles.

Their champ driver is 22-year-old Olle Nygren, well known in racing circles on the Continent and a member of the Swedish team in the International Moto-Cross Event. He's well experienced in handling the midgets on the slippery track, having set some records, and has gone into wide-radius turns at speeds as high as 100 mph. This may seem fantastic but there is an explanation which, nevertheless, does not detract from the danger or thrill of the sport. The cars use special spiked wheels for traction. •

In addition to winter lakes, numerous land tracks are flooded and frozen. This is the huge track in Stockholm Stadium where ice-racing draws crowds frequently numbering 20,000. Speeds average over 50 mph and one mile is four laps.



McCahill Drives the French

"Elégante, économique et bien française" is the way the manufacturer describes the new baby Renault—which to our Uncle Tom means "cute, cheap to run and as French as oo-la-la."

AS French as onion soup, Place Pigalle and the can-can, the little Renault is not a car to be passed over lightly. In these days of ever-increasing traffic, especially in big metropolitan districts, a pint-size, quick-wiggling bucket makes a lot more sense than a Cadillac. You can whip these overgrown scooters between cars and into parking spaces in a wink of the eye and compared with the big hulks the operating cost for an average week is like the price of a short beer to a magnum of champagne.

The last time I tested the baby Renault was back in 1948 (March 1949 MI). That was a four-door sedan. Recently MI Editor Bill Parker piloted one of the new Nash Rambler-type Renault convertibles out to my house where, on my own proving grounds, we loused

Renault

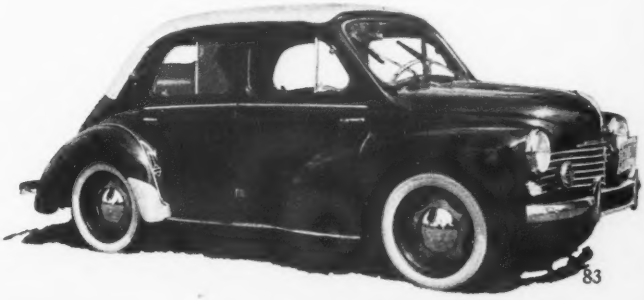
This diminutive, four-cylinder, valve-in-head power plant can be hopped up to give the 1,200-pound car a top speed of close to 95, the maker says. Unsouped, top is 65.

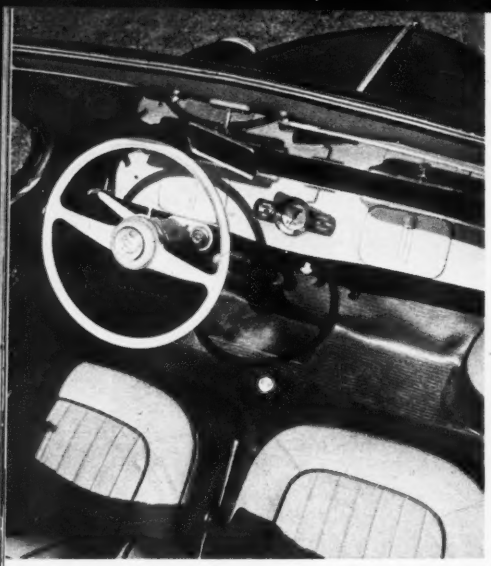
up the better part of two days trying to see if fifty million Frenchmen could be wrong about their pride and joy.

Actually, Renault is an older and better known name internationally than Cadillac or Packard in this country. Back in the days of the James Gordon Bennett trophy and of Teddy Roosevelt's pet expression, "Bully!" Renault built bully, fire engine-like cars that shook the ground for miles around. I once bought one second-hand that had a planked wood body and mahogany deck and looked exactly like the speed boats of that day. This job had a compression release for warm-up cranking. After a few turns the release was released and—brother! —swinging that gigantic mill was like trying to lift a diesel locomotive off the ground bare-handed. This car was about as long as a Chris Craft cruiser and it had a snarl that made the cops run for the woods.

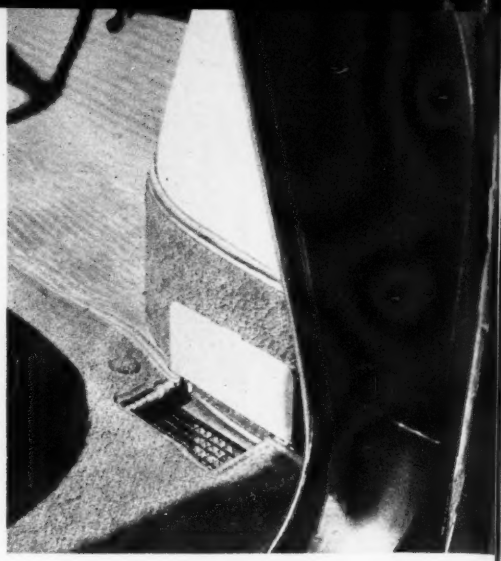
Get Pop to tell you how the great French taxi fleet, loaded with soldiers heading for the front, stopped Von Hindenburg from reaching Paris in World War One. These taxis crashed across the landscape and saved the day, a quarter of a century before the Jeep, and for the most part the cabs were big thundering Renaults. I remember the days when Renault was rated in the same category with Rolls-Royce, Minerva, Hispano-Suissa and Isotta-Fraschini. The Renault company was the

Costliest in the line, this convertible sells for about $1,500 F.O.B. U.S. ports of entry. Hardtop sedan prices start at around $1,200. Wheelbase is just 83 inches.





Gearshift, hand brake, choke and starter lever (the lower one with the ring on the end) are conveniently positioned between the front seats.



This is a heater vent, opening on a duct which brings hot air from the engine. Like those on most imports, Renault's heater is not so hot.

GM of Europe and at one time it turned out more cars than all American manufacturers combined.

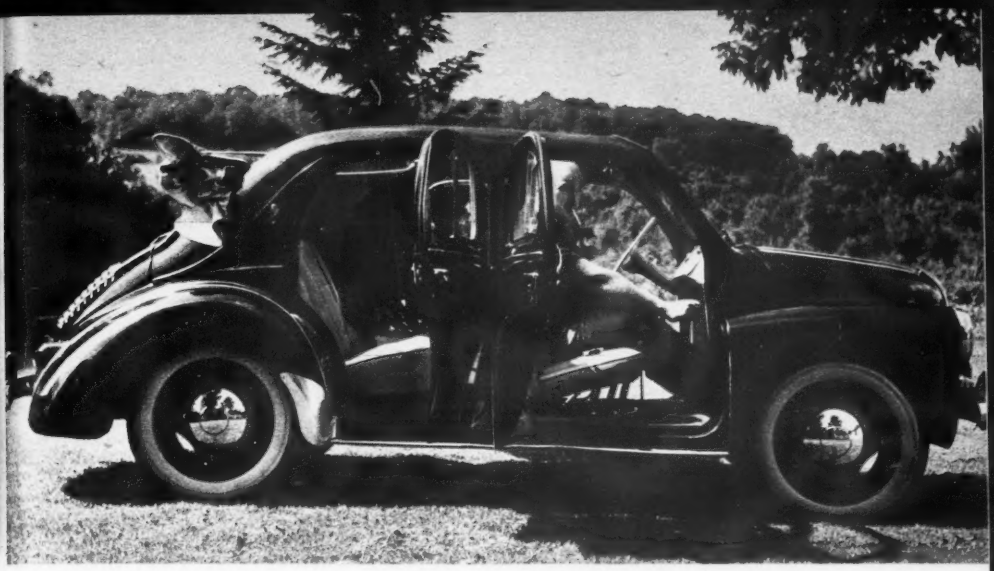
Just when they switched from making one of the world's largest cars to building the present four-door coffee can, I'm not sure but it must have been sort of like going from ocean liners to rowboats. Anyway, the number Bill Parker and I tested was a canvas top, solid rail convertible with a 23-horsepower engine in the rear, á la Auto Union or Volkswagen, and weighing a mere 1,200 pounds, just about big enough to carry along as a dinghy on one of the original Renaults. The car I tested three years ago was the same size except that the engine in 1948 was rated at 19 horsepower, or just short of enough moxie to yank a greased duck out of Joe's mouth.

Before going any further, I would like to get on record as stating I like the new Renault except for that one thing—size. This hors d'oeuvre dish is just too small for any real comfort if you happen to be one olive pit above average size. There is plenty of leg room for a six-foot driver but, oddly enough, it is lacking in room for the feet. To get at the pedals is like shoving your kickers into tight rubber boots with no room to wriggle the ankles. This is the same complaint I had when I tested the Renault three years ago. Three inches more in width and height and the car would be twice as useful for twice as many people.

But don't think for a moment that because of its size this can is a fugitive from a glue pot when it comes to performance. Actually the reverse is true when you consider engine size and economy. For instance, the Renault does zero to 30 miles an hour in 7.6 seconds, zero to 50 in 22.9—and also gives almost 50 miles to a gallon of gas. At the Le Mans 24-hour race in France last summer a two-carburetor, 747-cc four-door Renault sedan ran away with its class. This special Le Mans rig developed 40 horsepower through French hopping up of the conventional mill.

In my initial runs with the convertible in medium traffic I found it was all out when doing 65. But the car is so agile that I was passing all regular traffic on the highway. In a mountain climb the car went right up like a puff of smoke (but, of course, in low gear). From a roadability standpoint this little beanbag really shells out. It holds tight corners like grim death and the ride is top flight by any standards. The price of $1,527.52 delivered in New York for the convertible seems a trifle stiff—but after that nut is cracked the upkeep is peanuts.

The two-quart crankcase capacity, plus space for just two pints of grease in the transmission, are the features that make this a real economy barge. I particularly like the five-quart cooling system: throw



Clever designing which utilizes every inch of space enables the tiny Renault to boast of four doors, good head clearance and ample leg room.

in an old cork from a Prestone can and you're protected against freezing for the whole winter. Unlike most foreign cars offered on these shores the Renault has a 6-volt electric system with American sealed-beam lights, which means easy replacement of parts and batteries. Most imports have the 12-volt system which, though more efficient, is harder to have serviced in the U. S. The brakes are four-wheel hydraulic and excellent. The steering is a dream of real ease after some of those Detroit side-winders.

For the guy looking for a second car, for going to work or for just fighting city traffic, the Renault would be hard to beat. I feel the time is not too far off when there will be a major swing to smaller cars. The Nash Rambler, which is small by modern American family car standards, has proved this point. The days when you needed size for comfort and safety have long since passed and the time is right for short-wheelbase automobiles which can sprint through traffic like a broken field runner.

From any angle a 4,000-pound, 130-inch wheelbase car in today's traffic is the height of absurdity. Cars can be built that are twice as easy to handle as the big slobs, just as comfortable, safer, and much easier on the pocketbook, by taking off a thousand pounds in weight and 12 inches in wheelbase. For a guy of my tastes and dimensions, the Renault has shrunk a bit too much from its Old 97 size of long ago. But if you have average personal specifications, or are even a bit smaller than average, I suggest you take a look at the Renault. •

SPECIFICATIONS

MODEL TESTED:

1952 Renault Grand Luxe convertible

ENGINE:

4 cylinder, valve-in-head, rear-mounted; bore 2.146 inches, stroke 3.15 inches; piston displacement 46.3 cubic inches; developed horsepower 23 @ 4000 rpm; compression ratio 7.25 to 1

DIMENSIONS:

Wheelbase 83 inches; overall length 142 inches; tread 47⅝ inches front and rear; width 56¼ inches; height 57⅞ inches; weight 1,200 pounds; standard tire size 5.00x15; gas tank 7 gals; cooling system 5 qts; crankcase 2 qts; transmission 2 pints

PERFORMANCE:

0 to 30 mph, 7.6 seconds
0 to 50 mph, 22.9 seconds
0 to 60 mph, 38 seconds
Top speed, 65 mph

MI tests the '52 LINCOLN

Completely redesigned engine, body and chassis add up to "a magnificent automobile—but," our expert finds.

By Tom McCahill

THE 1952 Lincoln is the only 100 per cent new American car, with the exception of the Willys, that buyers on these shores will see for many a moon. There are no holdovers from former Lincolns. These cars, from tire tubes to tail pipes, are brand new in every way.

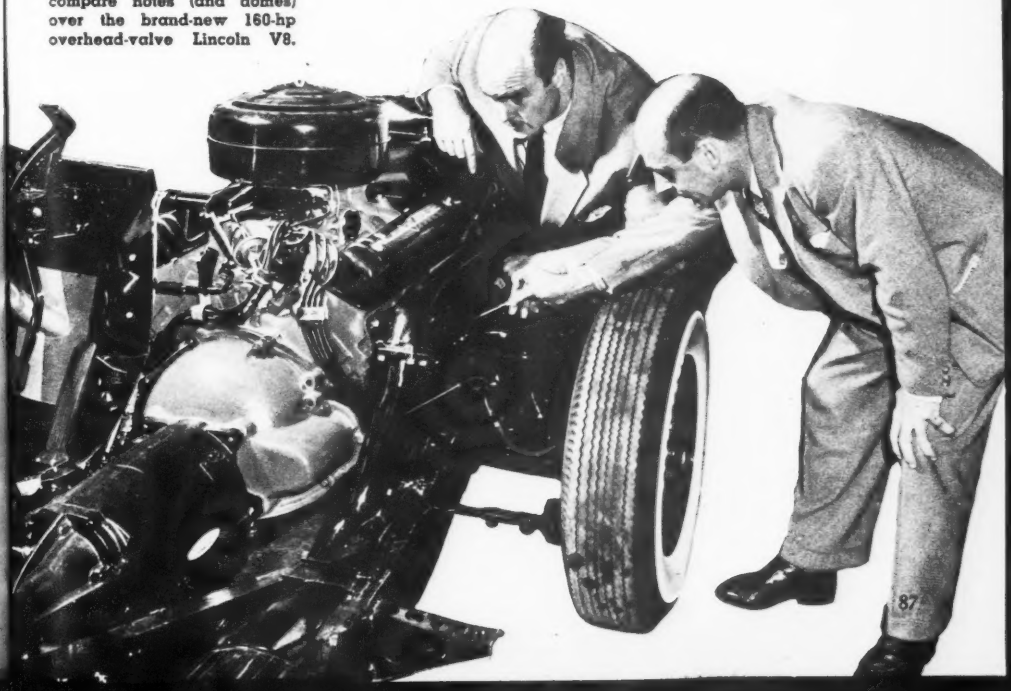
For Lincoln to scrap the tried and proven features of previous models and come up with a spanking new assemblage of bolts took a wagon load of industrial guts, in the face of today's topsy-turvy situation. True, in the looks department it would appear that the boys put on their burglar's suit and lifted some of their competitors' better-known style-marks. For example, Lincoln's new tail lights, though not exactly like the Cadillac's and without the latter's rear kick-up, nevertheless do look like the tail lights of GM's pin-up girl, only twice as big. The phony rear fender vents, this time smaller and slanted, also smack of close

knowledge of the Caddie and the Super 88 Olds, and so do the wheel discs. The front end and profile are bound to remind the close student of American Motorcana of certain other cars. But all in all these features add up to the best looking Lincoln since the days of the once glamorous Continental.

Underneath the skin the new Lincolns, from their strong and beautifully designed double-K frame to their Jaguar-type front wheel suspension and two-part muffler system, are all new. The fuel pump and oil filter are underneath the engine bed for cooler operation. The location of that oil filter, I might add, stirs up the nasty side of my nature. Unless I miss my guess, there will be some new and unprintable words added to the language every time a service man tries to install a new filter cartridge. In its present hideaway, the chances of getting a goodly mouthful and eyeful of oil are excellent. The filter must be attacked from underneath, presumably via a grease rack, and it's next to impossible to reach without some first class groaning and grunting.

The muffler system consists of two small pancake mufflers, about six inches apart, in tandem. These are located on different sides of a cross frame member and are connected by a short length of straight pipe that passes through a drilled hole in the cross support. It's my guess that before these cars are on the road more than a week, the hop-up boys will cut out the second muffler and insert a straight pipe in its place. This almost-too-simple alteration will immediately cut down back pressure and add a pleasant snore, as of a hibernating ground hog with laryngitis, to the exhaust.

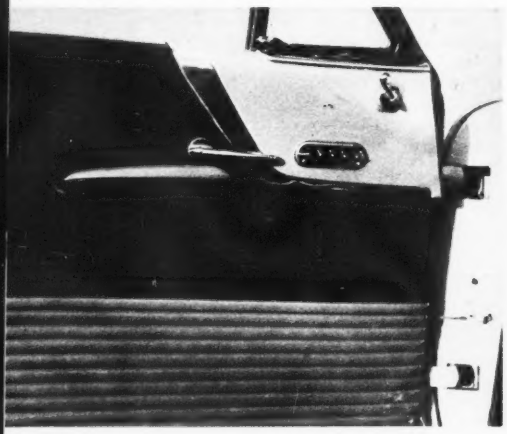
Uncle Tom and Phil Pretz, Lincoln-Mercury engineer, compare notes (and domes) over the brand-new 160-hp overhead-valve Lincoln V8.



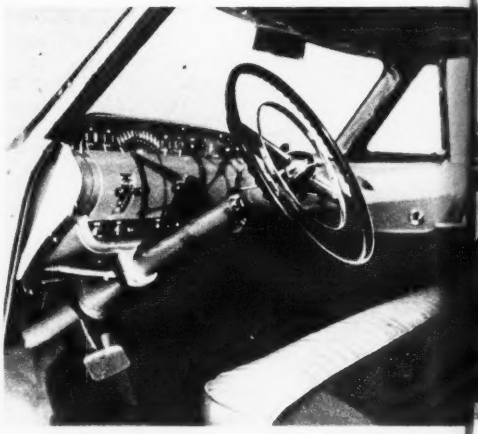
What looks like an opening around the headlight is only for decoration, our detective finds. But that gigantic bumper is not there just for looks.

And that vent-like looking chrome strip is also an eye deceiver which has been added this year. Looks pretty, though, doesn't it? Uncle Tom asks.

Automatic window controls, door levers, arm rests and upholstery on the inside of the doors are all typical of extra attention Lincoln pays to luxury.

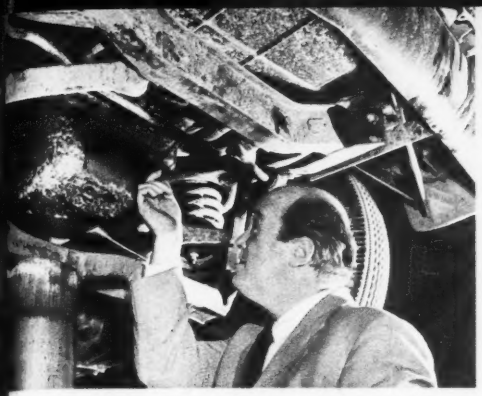


No fear of missing the massive foot brake pedal on the Hydra-matic Lincoln. Speedometer and other instruments are mounted high for good visibility.



Like the rest of the car, the engine is entirely new, from spark plugs to dip stick. It is a beautiful overhead-valve V8 that, purely from a looks standpoint, is way ahead of anything else in the country. In operation it is magnificently smooth in all ranges and purrs like the cat that not only swallowed the canary but the canary's whole family too. It is far superior to its rough predecessor, the L-head V8 of 1951. But—and this is a big but—if Henry Ford's name was Sam I'd be tempted to say, "Sam, you made the pants too small." And here comes an old beef that I have had against the Ford organization for years. It goes something like this:

The Ford empire was founded on economical transportation, specifically the history-making Model T. Economy is still the big talk at Dearborn and at times it seems to get a little silly. I may be wrong but I will always feel that a guy who can lay out close to four thousand fish for a Lincoln, or any car, doesn't give a damn whether he gets 16 or 18 miles to a gallon of gas. When a man pays this much money for transportation it is my contention that pride of performance and pride of ownership mean more than an extra mile or so per gallon. This buyer may never drive over 50 miles an hour but, like the V8 Chrysler owner, he gets a vicarious kick out of knowing that any car that passes him does so only with his permission—because without his permission no car on the road has enough speed to do it.



McCahill fingers the fuel pump which, along with the oil filter, is located underneath the Lincoln. Okay for cooling, he feels, but rough on mechanics.

"Best bumper jack I've ever seen" is Uncle Tom's appraisal of the two-legged, non-collapsing one which comes with other tools in the new Lincolns.

As for the looks of the new car itself, our Tom considers it the handsomest Lincoln since the days of the glamorous Continental, discontinued in 1948.

The 1951 Lincolns ran away with the Grand Canyon Economy Run not because they were world-beaters but because Cadillac, which won in 1950, switched to full automatic transmission in 1951 and lost out to the Lincoln-with-overdrive combination, a more economical rig. At this writing, overdrive is available on the new Lincolns as well as Hydra-matic. From some of the conversations I had with top Lincoln men recently, this may not be true for long; the overdrive unit may be dropped. It is being kept alive now only with the next Grand Canyon Run in mind —which is not particularly smart in my book, because without this feature Lincoln would be left with just another nice-running luxury automobile.

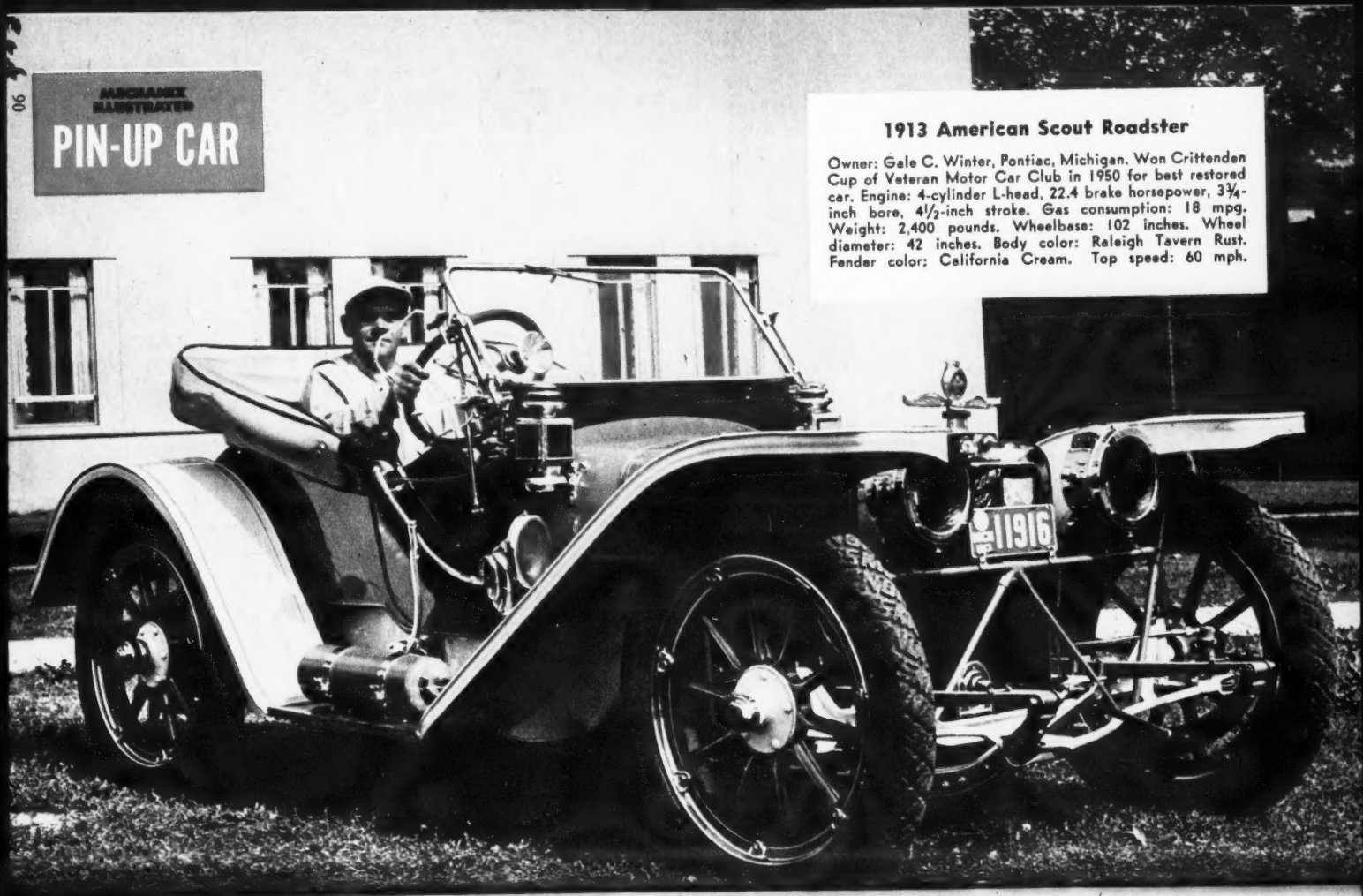
The new Lincoln engine is smaller than last year's flat-top V8, which was the biggest in the industry at 337 cubic inches. The new mill is 317 cubic inches and develops 160 horsepower (so they claim) as against last year's 154 horsepower. Now, Cadillac claimed 160 hp in their '51 engines and Chrysler 180 but—and here's another tremendous but—the 1951 Caddie and Chrysler claimed 312 foot pounds of torque and the new Lincoln engine only 284.

When I asked one of Lincoln's top engineers why they broke away from the trend and built the engine smaller when everyone else in the industry was going after more power, he threw that old plum "operating economy" at me. Don't think for a second that the new Lincoln is backwards in performance. It isn't. The Lincoln with overdrive is a real 100 mile-an-hour car. But it falls short of being a performance leader in its class, especially in the low pickup ranges.

The Lincoln is unique, however, in being the first new car in many a day that doesn't outperform its predecessor. And this one doesn't. The 1952 Lincoln with Hydra-matic took 14.8 seconds to get to 60 from zero in Drive all the way, and 14.6 starting in Low and shifting to High. In 1949 the first Lincoln with Hydra- [*Continued on page* 171]

MECHANIX ILLUSTRATED

PIN-UP CAR



1913 American Scout Roadster

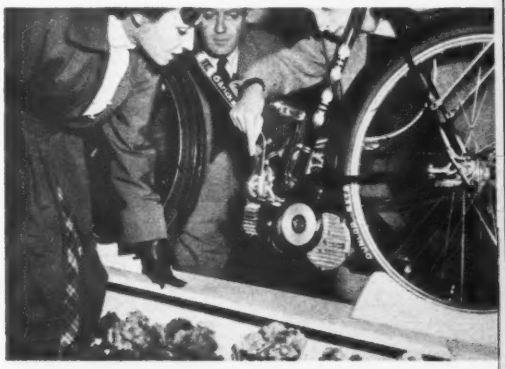
Owner: Gale C. Winter, Pontiac, Michigan. Won Crittenden Cup of Veteran Motor Car Club in 1950 for best restored car. Engine: 4-cylinder L-head, 22.4 brake horsepower, 3¾-inch bore, 4½-inch stroke. Gas consumption: 18 mpg. Weight: 2,400 pounds. Wheelbase: 102 inches. Wheel diameter: 42 inches. Body color: Raleigh Tavern Rust. Fender color: California Cream. Top speed: 60 mph.

Midget Streamliner goes record hunting. The Cooper 500-cc. racing car has gone to Paris to set some new times for the speed demons to shoot at. John Cooper admires his baby, left. Open hood, right, reveals driver Bill Aston behind the wheel.

WIN $25

Send in a sharp, glossy photo of a snazzy car, old-timer or new, posed as at left with owner or a pretty gal. Include self-addressed, stamped envelope (just in case) and all vital statistics about car and owner. Mail to Pin-Up Editor, MECHANIX ILLUSTRATED, 67 West 44 St., N. Y. 18, N. Y.

NEW for the ROAD



Bicycle One-Lunger made by S.P.A. Meccanica Garelli of Milan, Italy displaces 38 cc. and can be attached quickly to any cycle. Power transmission is by ribbed drum which is pressed against rear tire by springs. Fuel tank is carried over fender.

Street Striper does the entire job in one simple operation. It lays the center double line and outside lines in two colors at 10 mph. Special control enables driver to hold straight course. Inventor is Carl Sohmer of Tacoma, Wash. Police Department.

Exhaust Flame-Thrower is a new gadget for hot-rodders. Spark plugs set in the exhaust pipes ignite unburned gas in the vents which shoot out flames to a distance of 20 ft. on fast starts. It's noiseless and police want an excuse to prohibit it.

Honkers Away!

Goose hunters are fanatics. After you've shot your first gander you'll understand why.

By Raymond R. Camp

Rod and Gun Editor, N. Y. Times

YOU'D be surprised if you knew how many duck hunters are in complete sympathy with the singer who wails, "I wanna go where the wild goose goes!" Every year thousands of them do just that. They travel hundreds of miles to get a shot at a big goose.

As a wildfowler from a very tender age, I get a real kick when a bunch of teal, mallards, blacks or broadbill sweep in over the decoys. But there is something special in the way of a thrill when a big Canada circles the blind, lets out a querulous

Hunter on Nebraska's North Platte River rises from his pit-blind to watch a V of geese moving toward him. Retriever hides, knows what's coming.

Canadas are big birds, averaging 10 lbs. in weight. Don't shoot a flying swan by mistake. It's been done with regret.

"aaahnk aaahnk" and sets his big wings to glide in my direction. I sit in the blind not daring to move a muscle or wink an eye lest I frighten him off before he gets within range.

Many years ago I hunted on Merrymeeting Bay in Maine with an old warden. John was old, not only in years but in point of service, and he had lived out his days on the rim of the bay which is one of the resting points on the goose migration.

During his life he had taken his share of big black ducks, teal, wigeon, mallards, scaup and assorted other waterfowl but fate had always stepped in when it came time to kill a goose. As a result the prospect of killing a big honker assumed out-size proportions. The first day I shot with him was a perfect one from the duck hunter's viewpoint. The wind was increasing in violence, the clouds were low and dark and it was impossible for the waterfowl to raft out on the open bay. We lacked only two ducks for our limit when we heard a faint "aaahnk" and looked up to see a V of Canadas headed straight for us. Barring a

The gun roars, a goose drops and Dyna, the Chesapeake, retrieves it from the ice-choked water. These dogs and Labradors are the best performers.

In landing these heavy birds brake with their wings, split the water with their feet. Bird at right miscalculated and nearly took a nose-dive.

last minute change in course they were scheduled to pass about 50 feet over our heads.

"At last," John muttered. "After all these years. Don't you dare move. They're going to pass right over us."

And the chances are they would have done just that except for a trigger-happy gunner fully 200 yards to our right who touched of a barrage at the honkers when they were almost within range. The V swerved and rose and when it passed our blind the geese were well out of range. The only consolation John had was to give the other gunner a summons for shooting an unplugged gun. He had fired five shots from a pump gun that should have been capable of firing only three.

There is one happy hunting ground for the wildfowler who pines to shoot a honker, those shallow sounds and bays that stretch from Corolla to Ocracoke along the North Carolina coast. These waters with Mattamuskeet Lake adjacent to them form a major wintering ground for the Canada geese and it is an unlucky gunner who doesn't go home with his limit of geese after a few days in this area.

Currituck Sound, once a mecca for the market hunters who provided Baltimore and Washington with choice waterfowl, still attracts countless ducks and geese and the wild celery and succulent grasses of this shallow, almost tideless sound give the birds a real flavor. Several of the most famous duck clubs in the East, including the elaborate Whalehead Club, are located here and the area is still on the pilgrimage list of the real waterfowl enthusiast. And the southern extreme of this narrow waterway is one of the concentration points for pintails, one of the wariest and most sporting ducks in the world and second to none in flavor.

If you are lucky and can scrape up a connection, you may get to shoot at one of the old clubs that are still in operation on Currituck. But failure to do this does not mean you are out of luck for there are plenty of guides from Great Bridge to Maggie who have point and brush blinds on the Sound and can provide you with all the goose and duck shooting the law will allow. But beware of swans. These big white ghosts are the fly in the Currituck amber for they are almost as plentiful as the geese but are protected with zeal by the Federal and State wardens.

Geese do not like to come in to decoys if the swans are there also, and for this reason the latter take a perverse delight in sitting down right among your decoys. You can jump up and down in the blind, yell and even throw stones at these birds to get them to find another parking place but don't shoot at or near them. If a warden happens to be lurking nearby this can be an expensive procedure.

On one trip to Currituck we were shooting from a point blind. Several hundred yards out in the sound two gunners were rigged out in a brush blind and every five

Bert Comeau is proud of this goose which came too close and stopped a charge of 2's. Decoys, rear, are canvas.

minutes they had to chase swans out of their decoys. Some unhappy fate seemed to send the swans along just as a big bunch of ducks or geese were headed that way and the unhappy pair in the brush blind did not get a shot at legal game all morning.

In the afternoon one lone swan seemed insistant upon sitting down among their decoys. They would chase him away and he would circle their blind a few times and settle back. This went on for more than an hour and apparently one of the gunners could stand it no longer. As the swan set its wings to glide in a final time, we heard a shot and a cloud of white feathers exploded in the air. The swan made its last dive. And the gunner fired his first and last shot of that day. A warden appeared within a minute after the swan hit the water and when he left he had company.

Usually the goose shooter has advance warning of the birds' approach, for when they are seeking a place to sit down they usually are inclined to honk to each other and to the decoys. But there are other occasions when you hear nothing and are aware of company only when you happen to glance at the decoys and discover there are more present than you put out.

On my first trip to the Whalehead Club, I was paired off in a point blind with the late Ray Webster. It was a bluebird day and the birds were resting peacefully on the open sound. Occasionally a single or pair of ducks would pass but the geese were not flying.

Just before noon one wedge of geese approached from the north and we watched them with hopeful hearts. They passed well north of our blind, however, and eventually disappeared around a high dune behind us. We settled back in the blind for another doze but I was awakened a few minutes later by a gentle shake from Webster's hand. He was peering through the grass matting of the blind.

"Did you move our decoys over to the right side of the blind while I was taking a nap?" he whispered.

I shook my head.

"Well," he insisted, "they must have broken loose then, for they are drifting around on the water on that side now."

"Get ready to stand up and shoot when I count three," I suggested after a careful look through the grass. "Them ain't decoys, them's geeses," I announced in an effort at the local dialect.

Them was in any dialect, and we had no more worry about a goose limit. They were on their way by the time we got our guns to our shoulders, but the range was right.

The Mattamuskeet Refuge, which is open to limited shooting under the control of the U. S. Fish and Wildlife Service, offers both lake and field shooting and it is seldom that a hunter fails to get a limit of honkers. In most cases, especially on the lake itself, the hunter has both a duck and goose limit by 9 A. M. and is forced to spend the rest of the day hunting quail or deer.

The method of blind allocation is fair to all. A drawing is held at the Service Office the night before you hunt and each man draws his blind and guide. You may get the best blind one day and the worst one the next but it gives every shooter an even break. Guides are allocated a blind prior to the season and for a very small daily guide fee they provide blind, decoys and services. The farms surrounding the lake plant a lot of soy beans and as the harvesting of this crop is never complete, thousands of geese trade back and forth between these fields to feed. I have counted as many as 1,500 geese in one field the day before the opening of the season. Here they have pit and brush blinds and arrangements are made with the local farmer.

Goose shooting can be very deceptive to the novice for the bird is big and seems to be within range before he actually is. This results in a lot of misses. Also, on a crossing shot the shooter who is unfamiliar with the bird is inclined to underlead it. A goose is moving along at a good clip and the novice shooting directly at one with no "forward allowance" can burn up a lot of powder without getting his teeth into a roast goose.

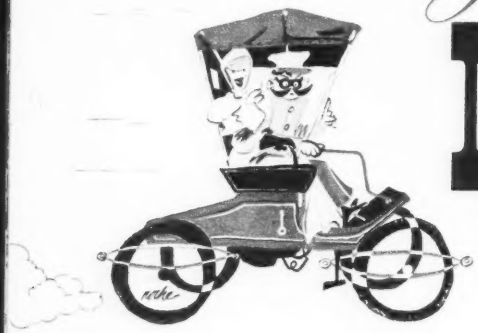
For this shooting, the full choke and an express load of number 2 shot is the most satisfactory combination and the magnum shotgun really comes into its own for combing down some high ones that otherwise would be out of range.

On Pamlico Sound you may do your shooting from a so-called "reef" blind, which resembles nothing as much as a piano box on 10-foot stilts. It sticks out of the water like the proverbial sore thumb and why a duck or goose can be lured to a point within a half-mile of this obstruction has always been a puzzle to me. Yet with a good rig of decoys the birds seem to come in with less fuss than they would to a point blind on shore. The answer may be that they are accustomed to seeing the blind for it is solidly constructed and is left on the reef all year.

Some of the Tar Heel guides are excellent "callers." They can pull in an echelon of geese that are high and wide but the sound they make bears no more resemblance to the "aaahnk" of a goose than it does to the wail of a banshee. But it works.

Unless you can afford the time and money for a trip to James Bay in Canada, Carolina is the best bet for those who want to go "where the wild goose goes." You will have a lot of sport and will find it a surprisingly inexpensive trip. •

Announcing



MI's OLD

Win this beautiful '52 NASH Rambler Station Wagon . . .

Complete rules and entry blank in the MARCH issue of

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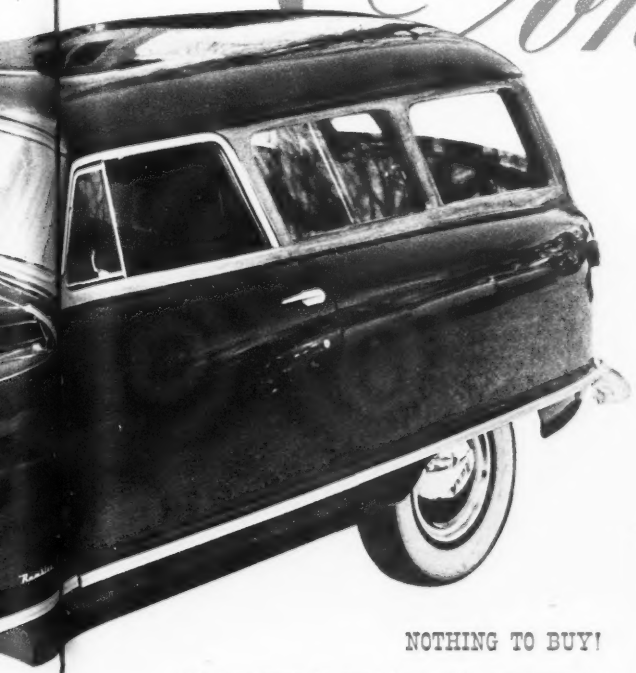

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MECHANIX ILLUSTRATED

At your favorite newsstand about Feb. 20!

hobby
HALL OF FAME

Ronald Reagan

Movielandlubber

ON board the S.S. America on her maiden voyage, actor Ronald Reagan asked to see the blueprints. One look and Reagan, a whittler from way back, was trapped. He wanted to build a model.

"I had all the material," he says, "but no experience. I had to find out that you don't put each piece into place as you finish it, that you don't paint the parts *after* you have them in place.

"I always carried a piece of the boat around with me and any time I had a spare moment, I'd drag out my knife."

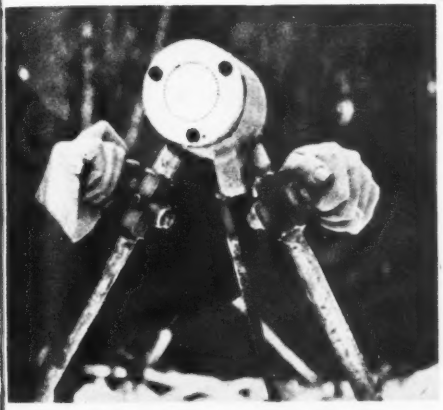
Finally it was completed—a fine scale model of the S.S. America. And since then, Reagan has made a model of the S.S. Challenge, a C-2 freighter. He plans to continue building model ships because, as he says himself: "a ship is a thing of beauty—whether it's on the high seas or on your living room table." •

Movie star Ronald Reagan, featured in Paramount's Hong Kong, left, surveys his model of the S. S. America, below. It took him a little over a year of spare-time work to complete the difficult job.

Snow Business Is Good

Out in California, the 2,250-foot ski jump at the Los Angeles County Fair is sprayed with powdered ice by high-pressure hoses.

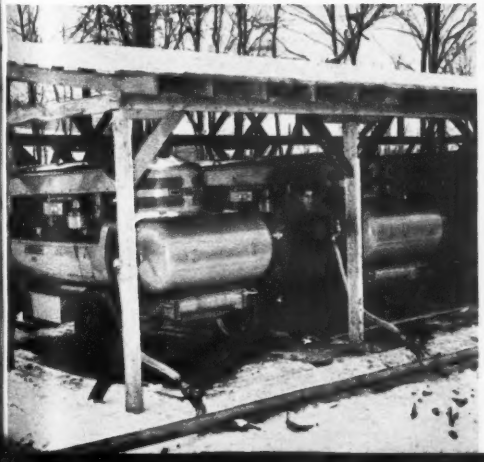
Nozzles sold by the Tey Mfg. Co., below, can be regulated to make wet snow for a base or dry snow for the surface layer.



AMERICA'S winter resorts are patronizing a white market this year—but the commodity is snow.

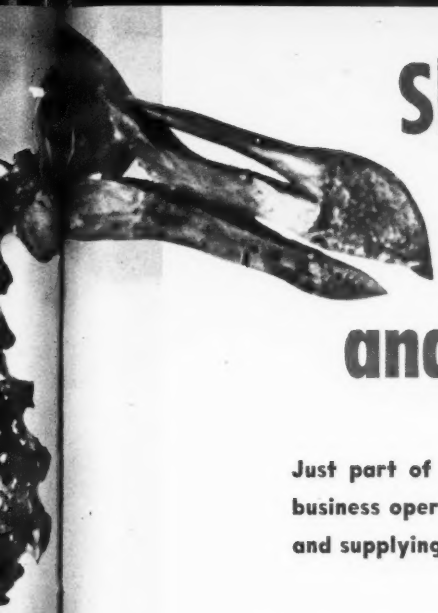
With the growing popularity of skiing and the continuing uncertainty of the weather, it was clear that something had to be done. And American ingenuity did it. The Larchmont Farms Co. developed a system whereby water and compressed air are driven through a simple nozzle. As long as the air temperature near the ground is close to freezing, snow is formed. Cost is about $1 per 100 square feet of snow. The Tey Manufacturing Corp. has come up with a similar system, too. And powdered ice has been used by resorts and parks for many years. Yes, big business is really making snow while the sun shines. •

Compressors must be used to power the mechanism. Tey estimates cost of setup which can produce one ton of snow a minute is around $30,000.



Blizzard of fine, powdery snow is sprayed by group of Tey nozzles on ski slope. Each nozzle can supply about one-quarter ton of snow a minute.

FOR SALE



Skeletons, Shrunken Heads and Butterflies

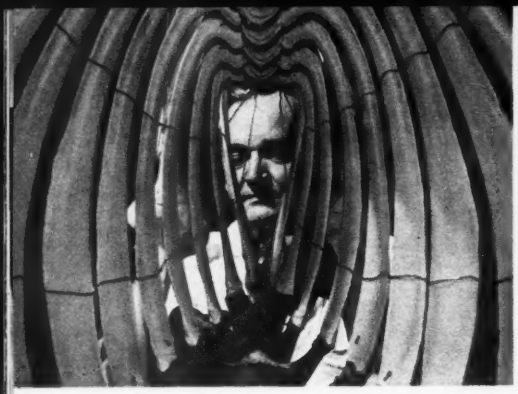
Just part of the stock in trade of a unique mail-order business operating from an abandoned New York winery and supplying museum oddities to customers everywhere.

By H. W. Kellick

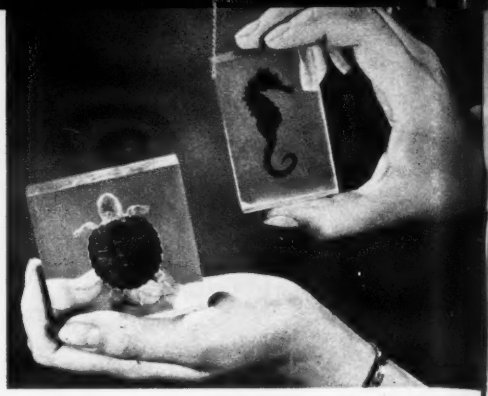
WANT a nice gorilla skeleton for $450 or the wing of a bat for $5 or a gastrolith 100,000 years old for two bits? How about a meteorite from the Toluca Valley for $27.50 or a human skeleton to hang from a ring attached to the skull for only $205? You can get these and thousands of other museum oddities via mail-order from Ward's Natural Science Establishment in Rochester, N. Y.

For over 88 years, this unique firm has been doing a flourishing business and many of the world's famous museums, universities, the armed forces, mining companies and tens of thousands of individuals are its customers. Ward's even sells minerals and radioactive ore to the Atomic Energy Commission. And, if they don't stock what you want, they will scout the world to get it.

Situated in an old winery which sprawls over 67 acres near Irondequoit Bay, Ward's has to be seen to be believed. Crowded, dusty rows of specimen cabinets and bins cluttered with fossils, skeletons, minerals and insects provide a giant general country-store atmosphere. In a huge cellar of the



For student veterinarians William Kruse, Ward's head osteologist, assembles a horse skeleton.



A small turtle and sea horse in plaques of Bio-Plastic, a new preservative developed by Ward's.

Dr. Dean Gamble, company's president since 1940, compares hen's egg with one from an Aepyornis.

Bug-collector's kits are sold to customers who frequently sell back unusual specimens they find.

old winery, which is jokingly called the "dungeon," the visitor suspects that the place is overrun with Frankenstein-type monsters ready to leap out at him at the slightest provocation. Tables are piled almost to the ceiling with animal bodies while workers embalm them. Like a scene out of a horror film, technicians inject colored dyes into the bodies so that veins, arteries and nervous systems can easily be traced during dissection.

The large, damp cellar is also strewn with crates of turtles, tanks of live fish, preserved dogfish and cases of embalmed frogs.

The mineralogy department which occupies two rooms on the main floor smells from the pungent odor of hydrochloric acid which is employed in the cleansing of crude specimens. In fact, most departments smell from one type of odor or another but the most sickening are those which emanate from the osteology department where skeletons are cleaned and assembled. It's hard to believe there's a market for skeletons but the fact is that Ward's ships more than $50,000 worth of skeletons a year and can't keep up with the demand.

No one seems to know how many thousands of items are stocked. What's more, no one really seems to care. A leisurely air prevails among the 70 full-time employees who apparently never worry about speed in filling an order. "After all," stated one executive, "what harm is done if your beetle or butterfly arrives a week or two late." Despite this carefree attitude and the fact that the firm never advertises or

Charles Papp, famous European entomologist now at Ward's, inspects some rare tropical butterflies.

Samuel Tuel points out interesting details of a fossil reptile crated for shipment to a museum.

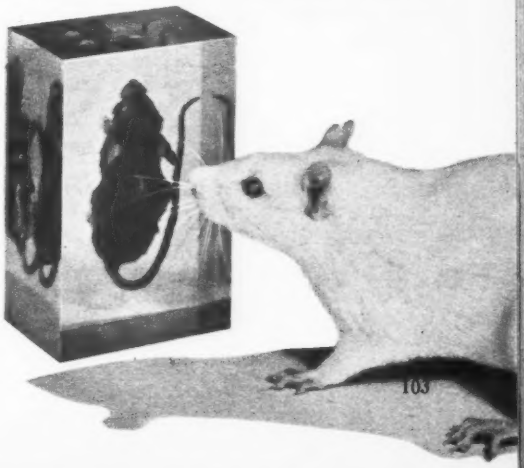
Packing has always been a major problem. This horse skeleton is worth several hundred dollars.

employs field representatives, the establishment grossed more than $500,000 last year.

The mineralogy department is the most active branch of Ward's business. The hobby of mineral collecting has grown tremendously in recent years and Ward's has geared itself to supply the demand for anything from coal to diamonds. This department also sells Geiger counters, prospecting tools and furnishes instructions to the uranium hunter.

According to the establishment, mineral collectors are particularly interested in lodestone (a natural magnetic ore from Arkansas) green copper minerals such as chrysocolla and reddish chunks of realgar which is a compound of arsenic. Alumite, which comes from France, Hungary and

The living and the dead, the latter encased in plastic for object study by natural science students.



Italy is also a popular item with collectors. Specimens can be bought for as little as 50 cents each.

This department often is called upon to fill unusual orders. Not long ago, a Hollywood producer required actors to run gold through their hands and parade through a field of the stuff. Ward's answered the S.O.S. and filled the order with fool's gold.

The Rochester firm depends mostly upon free-lancers for its source of material. A prospector in Colorado, for instance, supplies radioactive ore. A young lad in Erie, Pa., bought a net from Ward's and spends his week ends chasing butterflies which he sells to the firm. A man in Africa ships crocodiles and big game. A South Carolina housewife roams the woods for beetles, bugs, toads and frogs which she sells to Ward's. A schoolboy in Pennsylvania supplies black widow spiders. Tusks come from Alaska traders, and G. I.'s stationed in the far-flung parts of the world earn extra money by supplying everything from rare birds to asps.

In the many years that Ward's has been in business it can't remember a time when it has been gypped by a free-lance contributor. However, the firm has had material sent to it that has turned out to be other than what the owner claimed it to be.

One such item was a mummy dug up in a cave out West which was supposed to have been some kind of missing link. It turned out that this was apparently an old prospector who had crawled into a cave and died and was very similar to the rest of us humans.

Accustomed to receiving many strange requests, Ward's once heard from a gentleman in India who asked for a small loan and guaranteed to repay it by supplying an abundance of human bones. Then there was the time a man wrote from New York City saying that he would need a live tapeworm. It seems he was hawking patent medicines and wanted to "scare" his customers. He told the firm that he had been using a piece of noodle but the trouble was it disintegrated every few days and he had to keep changing the specimen. For ethical reasons, Ward's turned down the order.

It's not uncommon for Ward's to get offers from people wanting to sell their bodies. Since there are strict laws regulating the procurement of cadavers, it politely turns down all such offers.

Restoration of fossils and the mounting of animals is a popular and important department at the establishment.

Perhaps one of the most famous specimens ever prepared by Ward's was P. T. Barnum's giant elephant Jumbo which is now in the museum of Tuft's College. When Jumbo died Barnum got the late Professor Ward and some of his technicians to come and skin the animal and prepare it for mounting. Ward completed the job, but he almost lost his shirt since it was such a huge and expensive undertaking.

In keeping pace with modern science, Ward's Dr. Robert Roudabush recently developed a revolutionary process called Bio-Plastics. Specimens from embryos to bats, formerly preserved in liquid, now can be housed in plastic and kept perfect forever. Although Ward's could have kept the process secret, they unselfishly published it and even sell kits for as little as $3.95 so that anyone can use the formula at home.

Ward's has dealt with many strange world-wide collectors, but the daddy of them all will always be its own Henry August Ward, founder of the establishment. Born in 1834 in Rochester, N. Y., Henry started collecting at the age of three when he presented the city's university with a small rare pebble which now reposes in the school's rock collection.

As Henry grew older his interest in collecting multiplied. He made 57 trans-Atlantic crossings exploring ruins, caves, jungles and mines and he always returned home with tons of rare specimens. He was the first man to employ diving equipment in collecting marine specimens and he's recorded as being a pioneer in using balloons for geological surveys.

In 1906, at the age of 72, this fabulous collector was killed by an automobile while crossing a Rochester street. His collection became the property of two members of the family who, in 1927, presented it to the University of Rochester. A couple of years later a fire destroyed the building and almost 70 years of patient collecting went up in smoke. As a result the University gave up the business and sold it in 1940 to Dr. Dean L. Gamble, an ex-Cornell professor, and F. Hawley Ward, second cousin of the firm's founder. Today under the presidency of Dr. Gamble, the establishment is flourishing beyond its founder's wildest dreams.

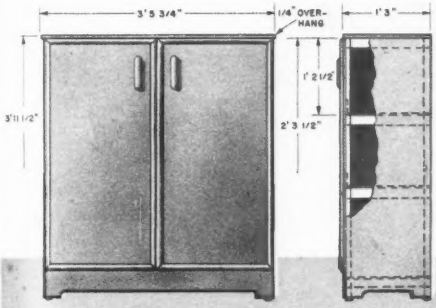
The assortment of fabulous items which are shipped daily from Ward's storage bins taxes the human imagination. In a typical week, for instance, Ward's sent a ten-cent butterfly to a client in Idaho, a bison's head to a noted artist, a cabinet of assorted minerals to M.I.T. in Boston, a collection of seashells to a New York psychiatrist and disarticulated human bones, skulls and skeletons to pre-med students in Chicago. A mounted skeleton of a cat and a box of disarticulated dog bones were shipped to a Los Angeles veterinarian.

Almost anything can happen here and it frequently does. Typical is the wire received from a laboratory worker of a western university: "Tragedy befell our cockroach colony. Please rush six dozen hatchable cockroach eggs via airmail." Ward's filled the order. •

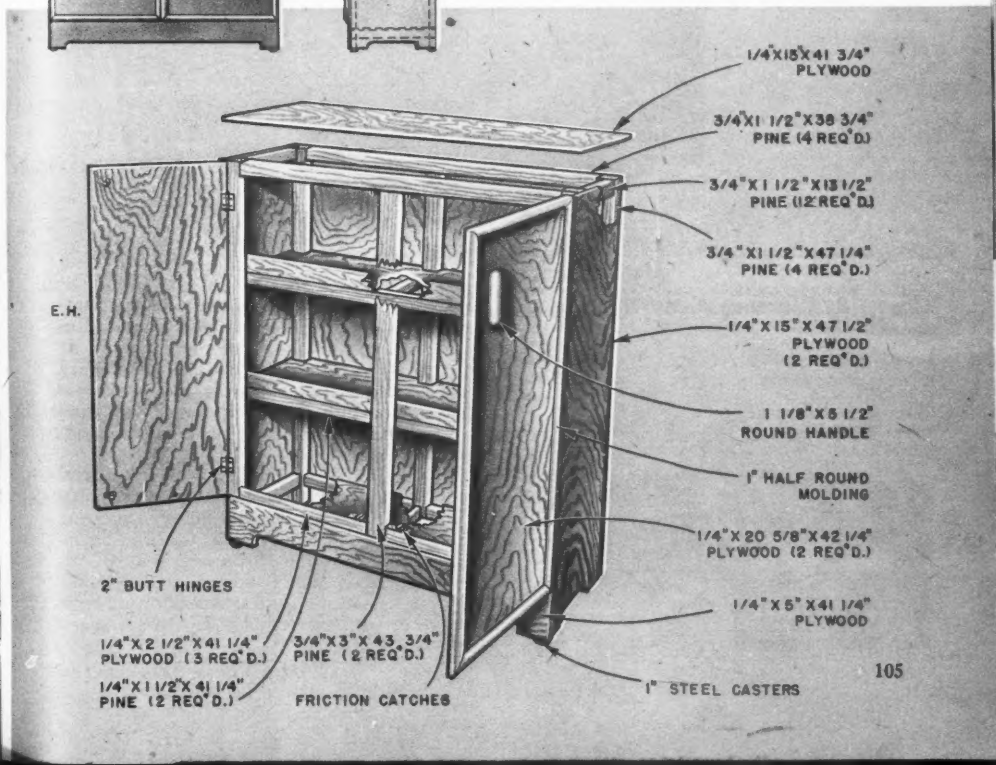
mi crafts and hobbies...

Bedroom Chest

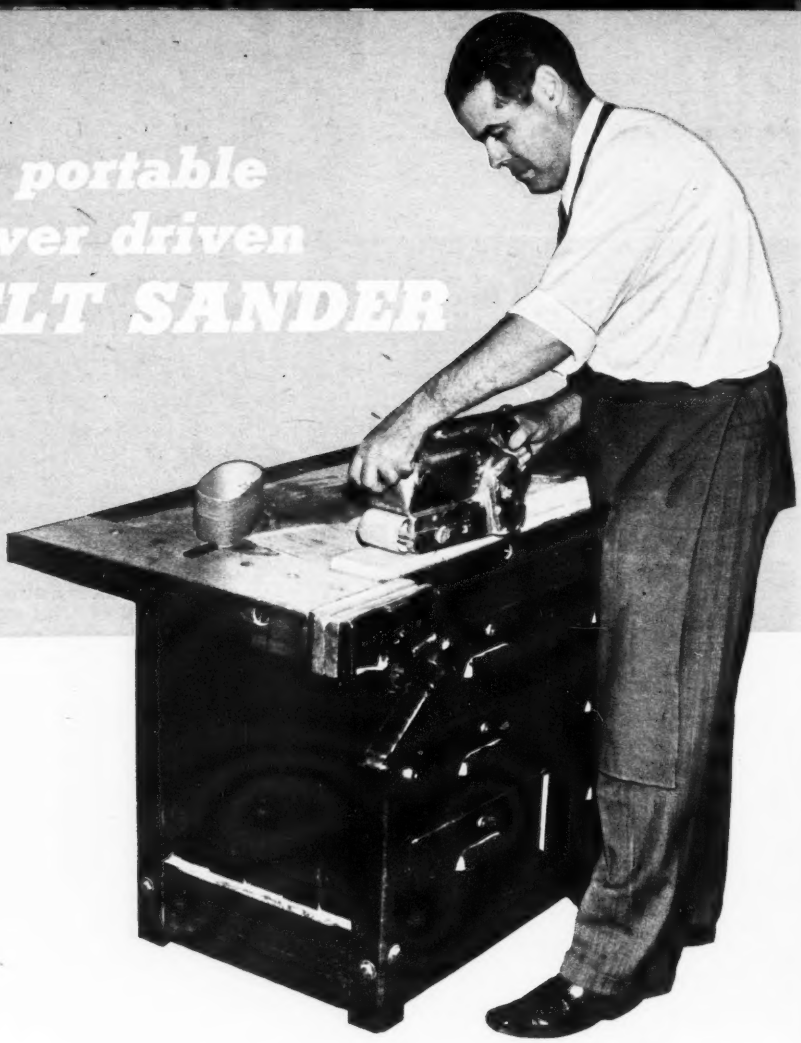
Drawerless wardrobe instantly reveals its contents when doors are opened. Articles used most often, like shirts, should be placed on the upper shelf.



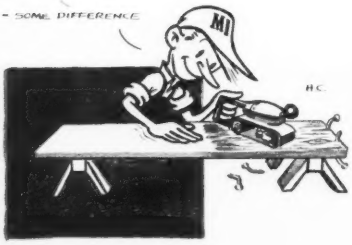
WHY bother with drawer construction in a bedroom cabinet? This economical model can be easily made from ¼-in. or ½-in. plywood, scrap framing, and half-round molding. Our unit was painted flat cream inside, and semi-gloss buff outside. The doors, stiffened by molding, are held shut by friction catches.—*Lyndon Ripley* •



the portable power driven BELT SANDER



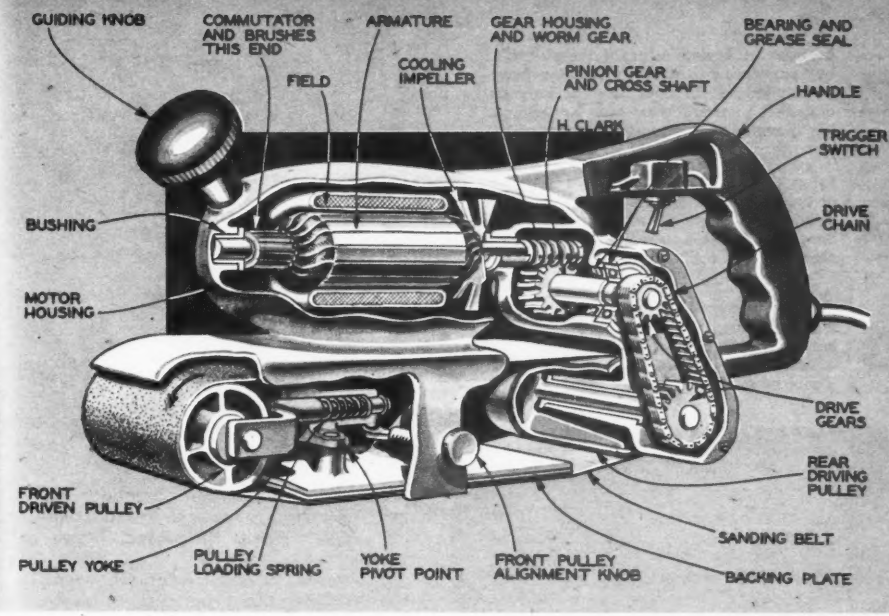
By Clarence A. Martin



THE construction of any woodworking project is interesting and a lot of fun. But the sanding operations, if completely done by hand, are slow, tedious, and just plain work to most people. About seventy-five years ago craftsmen began to feel the same way, and as a result invented and began using the first sanding machine.

At the present time there are five kinds of sanders being used. These are the continuous belt, the disk, the drum, the spindle, and the automatic types. Let's look at the first mentioned, leaving the others for a later issue of MI.

The continuous belt sander may be either stationary or portable and consists of an endless sanding belt that runs over two or more



Belt is placed over the pulleys so that it will run in direction indicated by arrow printed on it.

Every six months the chain case should be cleaned and repacked half full with a special grease.

Adjust aligning screw so that belt runs in center of the pulleys and won't rub against frame.

Armature bearing is lubricated by removing knob and stud. Check the worm gear every two weeks.

Rough lumber may be sanded diagonally or even against grain. Finish with grain, using fine grit.

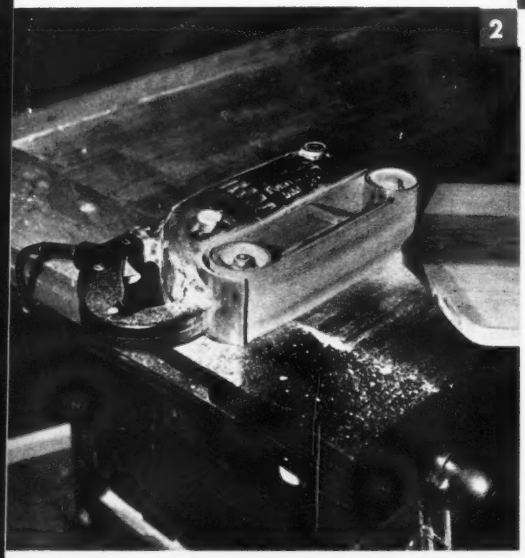
A felt belt replaces standard sanding unit, converting machine into a time-saving furniture polisher.

1 Because of basic design of the portable belt sander, no pressure or pushing need be applied by the operator. The lady at the right demonstrates this by buffing her paneled walls quickly and easily.

2 By cutting a recess in your workbench, or constructing a special frame, you can convert your portable sander into a stationary unit. The front pulley may be employed for smoothing any curved areas.

3 For removing old finishes, you'll find this tool indispensable. Employ open grit belts for this purpose. Here the machine is used to minimize one of the most monotonous tasks of any boat owner.

1



2

3

pulleys. The combination sander and the bench sander are other styles and are used on smaller work, the object being held against the belt.

The small portable sanders, which are the most popular type in use today, have belts as small as two inches by twenty-one inches, while the stationary types have wide belts that are over twenty feet in length. Portable models are light, not too expensive, and will satisfactorily do a majority of your sanding jobs in a fraction of the time required by hand.

The belt on this machine runs over a shoe that corresponds to the table and around two pulleys. As the pulleys do not come in contact with your work, hollows are not gouged into the surface when the machine is used for flat sanding.

The portable belt sander will sand either flat or curved surfaces. It smooths, levels and edges. It removes tool and cutter marks and will chamfer, round, or bevel. Paint and varnish may be removed rapidly with the use of open grit belts.

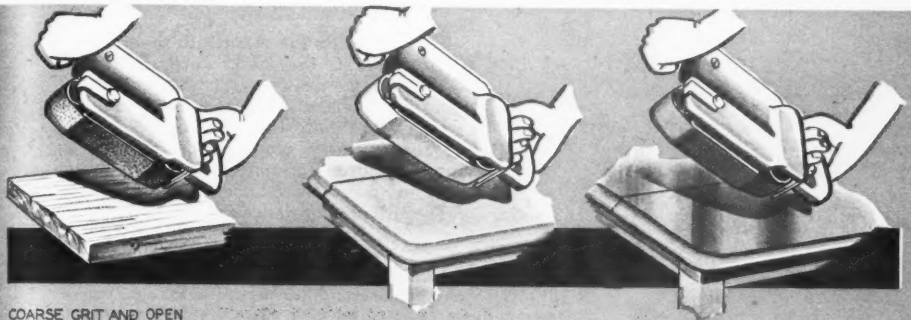
This machine may also be used in any position—horizontally, vertically, overhead, or on its side. You can use it on wood, metal, glass, or composition materials. When clamped in a vise or fastened in a special stand, it becomes a stationary bench sander for use on flat or curved surfaces. A boom and a counterbalance to hold the machine makes sanding vertical surfaces a much easier chore. Final polishing is speeded and made less tedious by substituting a felt belt for the sanding belt and then machine-rubbing the article.

Several precautions in the operation of the portable belt sander are advisable. Your line voltage should be checked with that stamped on the machine. A voltmeter or a 220-volt [*Continued on page* 174]

SPECIFICATIONS

MAKE	BELT		WEIGHT	PRICE
	width	speed (feet per minute)		
Mall No. 30	3 in.	825	9¼ lbs.	$69.50
Montgomery-Ward*	3 in.	825	9¼ lbs.	69.50
Porter-Cable No. A-2	2 in.	600	9 lbs.	62.50
Sears Craftsman No. 2230	3 in.	1200	15 lbs.	66.50
Skil No. 525	2¼ in.	600	9½ lbs.	69.50

* Made by Mall Tool Co.

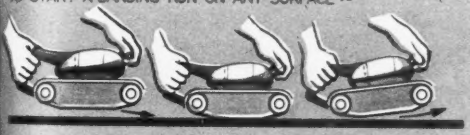


COARSE GRIT AND OPEN GRAIN BELTS ARE USED FOR TAKING DOWN ROUGH WORK AND REMOVING PAINT

FINE GRIT BELT IS USED FOR FINISHING OFF SURFACES

FELT BELTS QUICKLY REPLACE SAND BELTS FOR POLISHING OR BUFFING POLISHED SURFACES

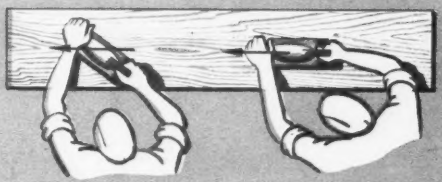
TO START A SANDING RUN ON ANY SURFACE ~



HOLD SANDER ABOVE WORK, START MOTOR~

~LOWER SANDER, AT SAME TIME MOVE FORWARD OR BACKWARD AS NEEDED~

~COMPLETE PASSES BY LIFTING SANDER UP, CLEAR OF WORK, SHUT OFF MOTOR



FOR ROUGHING DOWN WORK, MOVE WITH GRAIN, HOLDING SANDER ON SLIGHT DIAGONAL

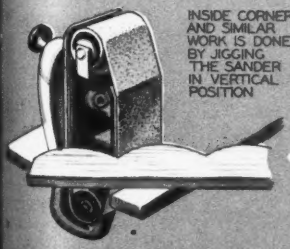
FOR FINISH SANDING HOLD SANDER WITH, AND MOVE WITH GRAIN

MACHINE'S OWN WEIGHT IS THE ONLY PRESSURE NEEDED - JUST GUIDE IT

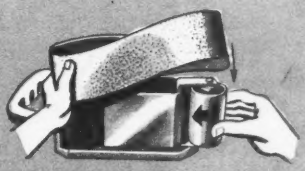
MACHINE IS BALANCED TO REST ON FLAT PRESSURE PLATE WHERE ALL SURFACE SANDING IS DONE

HOWEVER FOR ROUND OR CURVED WORK, EXPOSED FRONT PULLEY IS EASILY APPLIED

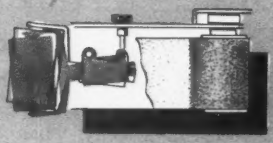
MACHINE CAN BE LAID ON SIDE IN A RECESSED JIG, WHICH EXPOSES PULLEYS AND BELT FOR EDGING AND OTHER END GRAIN SANDING



INSIDE CORNERS AND SIMILAR WORK IS DONE BY JIGGING THE SANDER IN VERTICAL POSITION

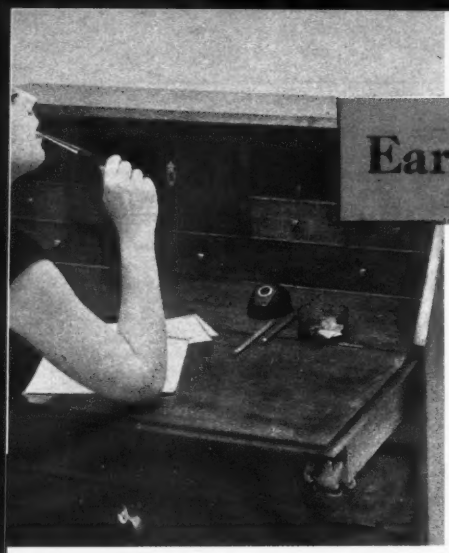


BELT IS PUT ON BY PUSHING SPRING LOADED FRONT PULLEY TOWARD REAR, SLIP ON BELT, -SPRING GIVES BELT TENSION



BELT ALIGNMENT IS ADJUSTED BY TURNING KNOB ON SIDE WHICH GOVERNS ANGLE OF PULLEY ROLLER MOUNT AXLE

Early American Desk



Above: Multitude of drawer space insures ample room for all stationery supplies. Below: Side view shows dovetail joints in top panel.

By Harold D. Mack, Jr.

ONE of the most beautiful pieces of Early American furniture is the slant-front desk which makes a rewarding and utilitarian project for the amateur cabinet-maker. This design, dating from the middle of the 18th Century, has been reproduced with the dovetailing so characteristic of the prototype.

We will divide the work into several operations: first, the framework, then the complete large drawer assembly and base, next the interior drawer and pigeonhole section, and finally the finishing.

I used cherry wood but the desk is equally beautiful in maple. Just remember that the harder woods are more difficult to work with than soft woods.

To facilitate construction, you may want to dispense with some of the drawer locks. Leaf hinges are recessed for both strength and appearance.

LARGE-SCALE PLANS

will greatly simplify construction. Send fifty cents to MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Connecticut. Specify Plan No. F-5.

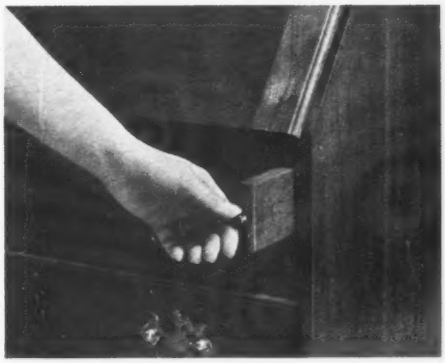
The side panels may be assembled by doweling and gluing several pieces of stock. Cut and trim to 36½x18¾ in. and cut the slant front as shown. Now lay out the locations of the four basic frames and the desk surface. Cut the ¾-in.-wide dadoes ¼ in. deep to accept the frame members. Rabbets, ¼-in. square, are made for rear panel.

The basic four frames, or drawer supports, can be made by either doweling or tenoning. You will note from the sketches that we made ⅜-in. tenons on the shorter pieces. The over-all dimensions of each support are 36⅝x17¾ in. Assemble four frames and clamp tightly.

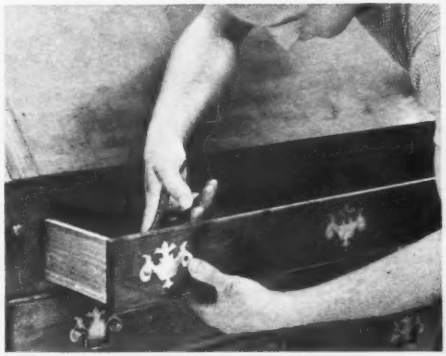
Now cut the desk leaf from choice wood with a nice grain. Cut accurately and match all pieces for frames and desk surface. Glue up the frames ¼ in. from the front edge of desk surface and side panels. This procedure will take considerable effort to insure tight fits and proper glue joints. Four clamps were used in this case and job was tight and strong.

The top panel is now cut and dovetails, if desired, are cut on each end. Placing the panel on top of the desk, mark off the dovetails with a sharp scribe. Then saw down with a back saw *inside* the lines. Cut the tails with a scroll saw and file to obtain neat, tight dovetails. Practice on a scrap piece first. You may want to omit the dove-

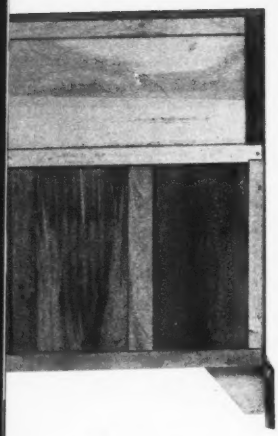
If desired, a secret drawer for the key to the drawers may be incorporated into one of the scroll designs over either of the end pigeonholes.



To hide the end grain on the sliding rests, glue on a strip of stock so that its grain runs in the same direction with the pieces flanking top drawer.

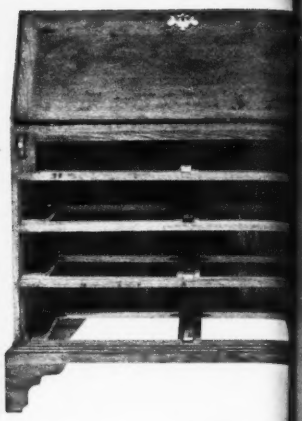


Although you should bore holes for all the pulls, do not actually attach them until the finishing has been completed. They'll only get in your way.



Use of plywood for backs is single departure from design of antique desk.

The closed desk presents a handsome appearance when viewed from front.

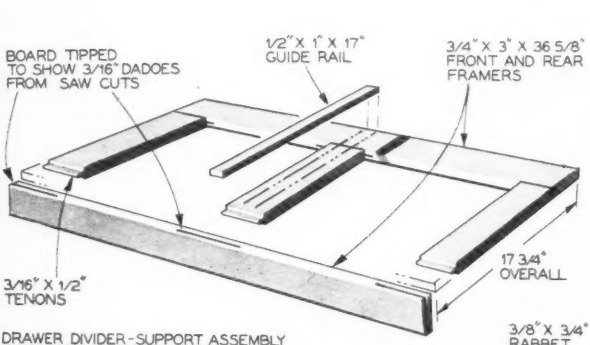


Exposed framework shows the mortises. These can be cut on your circular saw.

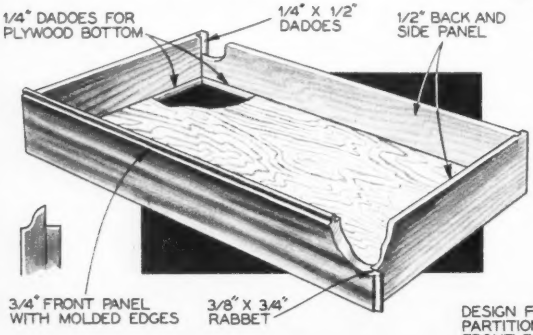
tails and make a tight butt joint instead.

Install the desk leaf slides. Cut the slides themselves first, and then the material for the troughs which will accept them. Place stops about 3 in. from the rear of the troughs. The front ends of the trough elements are recessed ¾ in. from the front edges so that the front strips of the slides will be flush with outside of the desk.

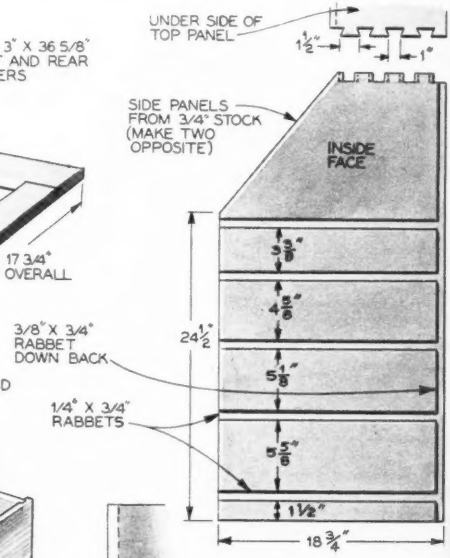
To make the slant front, cut the panel and apply the edges by tongue and groove joints and glue. Rabbet the inside top and two sides and shape the outside top and two sides, thus com- [*Continued on page* 156]

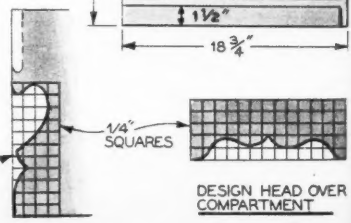


DRAWER DIVIDER-SUPPORT ASSEMBLY

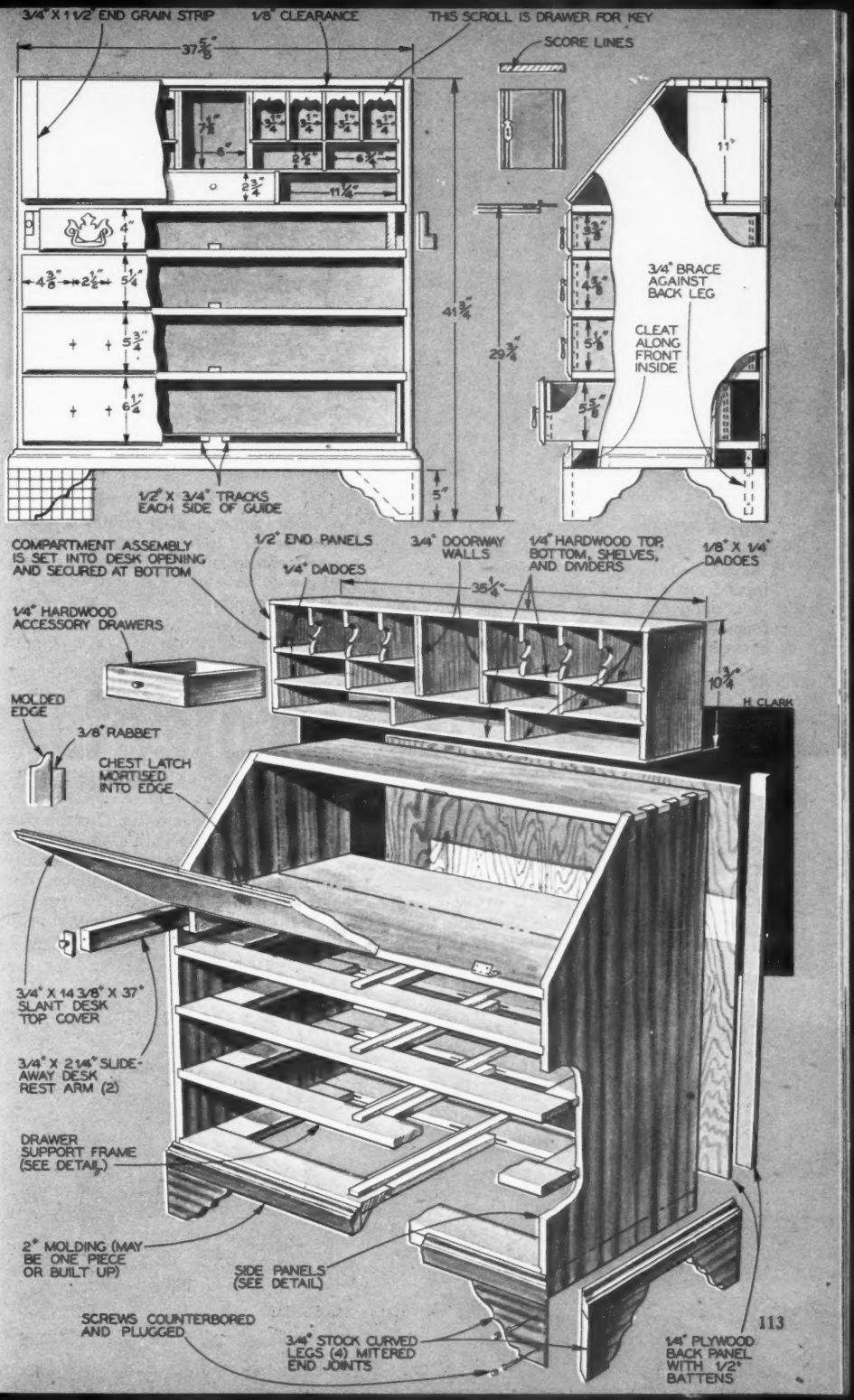


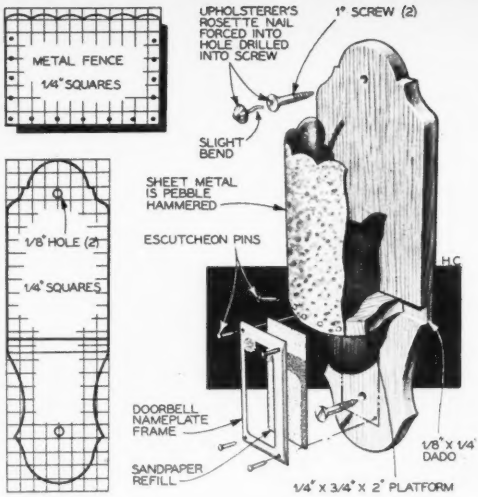
DRAWER CONSTRUCTION (FOUR SIZES)





DESIGN HEAD OVER COMPARTMENT

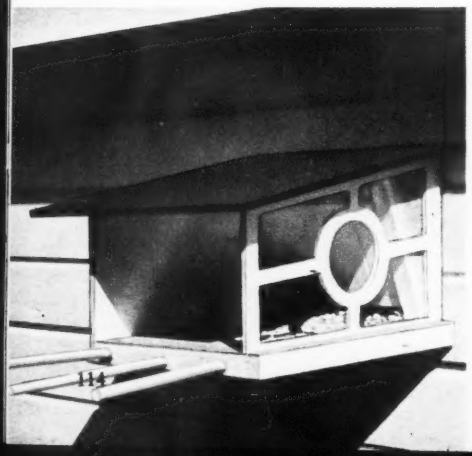

3/4" X 1 1/2" END GRAIN STRIP
1/8" CLEARANCE
THIS SCROLL IS DRAWER FOR KEY
SCORE LINES
37 5/8"
7 1/8"
6"
2 1/2"
6 3/4"
2 3/4"
11 1/4"
3/4"
4"
4 3/8"
2 1/2"
5 1/4"
5 3/4"
6 1/4"
41 3/4"
29 3/4"
5"
1/2" X 3/4" TRACKS EACH SIDE OF GUIDE
11"
3 3/8"
4 5/8"
5 1/8"
5 5/8"
3/4" BRACE AGAINST BACK LEG
CLEAT ALONG FRONT INSIDE
COMPARTMENT ASSEMBLY IS SET INTO DESK OPENING AND SECURED AT BOTTOM
1/2" END PANELS
3/4" DOORWAY WALLS
1/4" HARDWOOD TOP, BOTTOM, SHELVES, AND DIVIDERS
1/8" X 1/4" DADOES
1/4" DADOES
35 1/4"
1/4" HARDWOOD ACCESSORY DRAWERS
10 3/4"
H. CLARK
MOLDED EDGE
3/8" RABBET
CHEST LATCH MORTISED INTO EDGE
3/4" X 14 3/8" X 37" SLANT DESK TOP COVER
3/4" X 2 1/4" SLIDE-AWAY DESK REST ARM (2)
DRAWER SUPPORT FRAME (SEE DETAIL)
2" MOLDING (MAY BE ONE PIECE OR BUILT UP)
SIDE PANELS (SEE DETAIL)
SCREWS COUNTERBORED AND PLUGGED
3/4" STOCK CURVED LEGS (4) MITERED END JOINTS
1/4" PLYWOOD BACK PANEL WITH 1/2" BATTENS

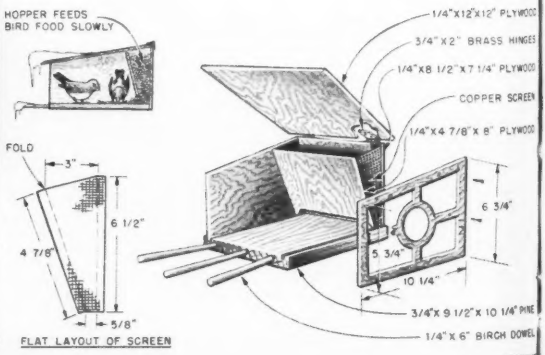


Match Holder. This gadget will give a lifetime of service. Cut the back from a ¼x2x6¼-in. piece of wood. Make the platform from a ¼x¾x2-in. piece and glue it in a dado cut in the back. The fence is formed from a 2¼x3-in. piece of hammered sheet metal and is secured with escutcheon pins. A brass name-plate holder is fastened below the shelf to hold a replaceable sandpaper striking surface. Secure the gadget to the wall with two flathead screws; one is hidden by the sandpaper, the other is disguised with an upholsterer's nail pushed into a hole in it. •

weekend projects

Bird Feeder. Help your feathered friends through a tough winter and enjoy their presence near your house by making this feeder and placing it near one of your windows. The roof is hinged for putting bird feed or cracked corn in the bin at the back of the feeder. The cut-out side should face south so sunshine can enter. Cut the pieces to size and assemble with 1-in. wire nails. Add copper screening to the open side of the bin to hold the feed in place. Three lengths of dowel driven into the front edge will serve as perches. Finish the project with a coat of paint. •





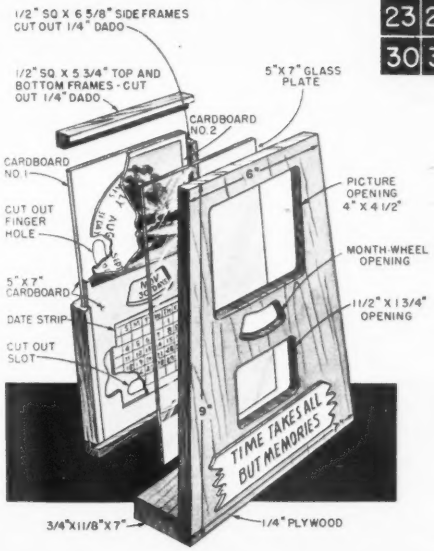
S	M	T	W	Th	F	S

DAY STRIP

cut out day strip, month wheel, and date strip and secure to cardboard with cement or glue

DATE STRIP

						1	2	3	4	5	6	7
2	3	4	5	6	7	8	9	10	11	12	13	14
9	10	11	12	13	14	15	16	17	18	19	20	21
16	17	18	19	20	21	22	23	24	25	26	27	28
23	24	25	26	27	28	29	30	31				
30	31											



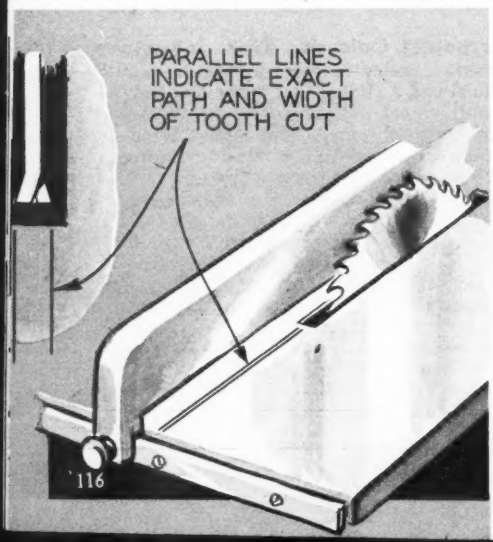
Perpetual Calendar. This ingenious desk accessory features a rotating month wheel and a sliding date strip. Cut out the month wheel, date strip, and day strip that appear on this page and mount them on cardboard. Prepare a plywood face and a 5x7-in. cardboard backing piece in which the two lower holes in the face are duplicated. Glue the day strip to the back of the cardboard and glue a picture on the face. Pin the month wheel to another 5x7-in. piece of cardboard so the months show properly through the opening in the first piece. Insert the date strip and, as shown, add a piece of glass, a rabbeted frame, a base, and, if desired, a motto. Holes in the back piece of cardboard allow the month wheel and date strip to be moved. •

Chair Refinishing. When painting a chair, drive a nail or screw a short distance into each leg. You can thus tackle the more difficult bottom area, then turn chair upright to complete job without soiling the floor.

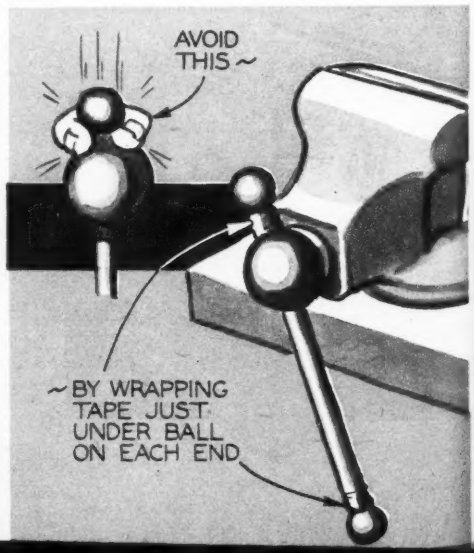
Glue Saver. Powdered glue is hard to mix in small quantities, so why not mix it in place? Moisten the edges to be joined and sprinkle the glue on one edge, smearing with a brush. Clamp work in usual manner.

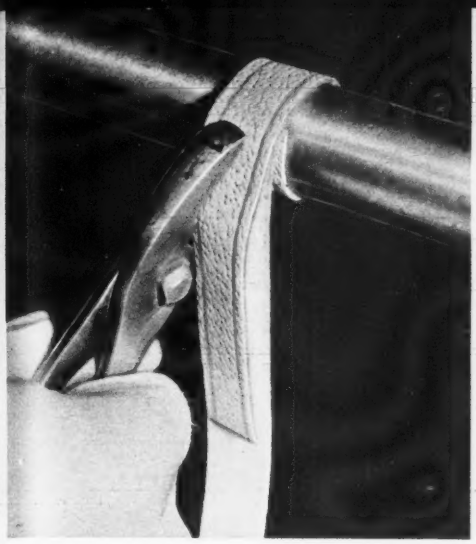
Craftsman's Corner

Blade Thickness Guide. Two lines indicating exact blade clearance offer greater accuracy. Use a carpenter's square aligned with teeth on both edges of your blade, or some scrap fed through both sides of blade.

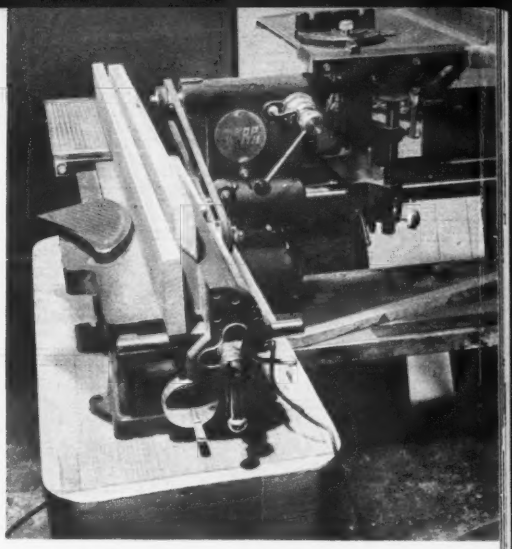


Finger Guard. To prevent the heavy handle on your vise from sliding down and pinching your finger, wind a few lengths of friction tape beneath the knob at each end. Tape will act as protective bumper.



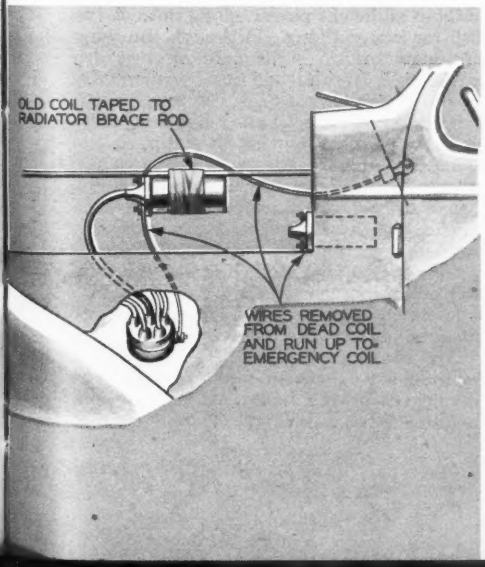


Surface Saver. Polished pipe or tubing can usually be turned without leaving ugly tool-jaw marks if a heavy leather strap and a pair of pliers are applied as shown above. Bear down hard on the plier handles. If the strap slips, try coating it with common belt dressing to make a good nonslip bond.

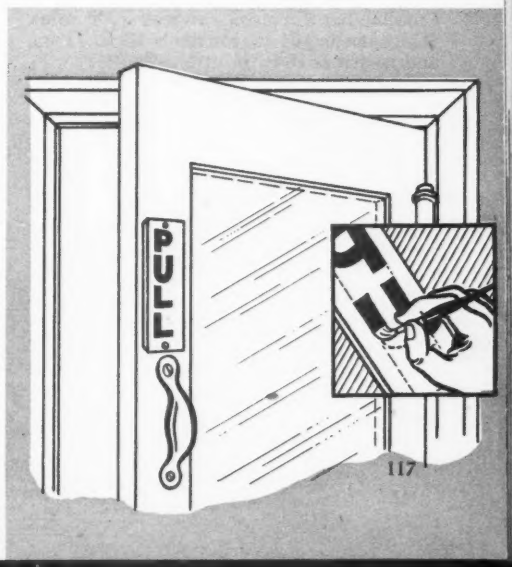


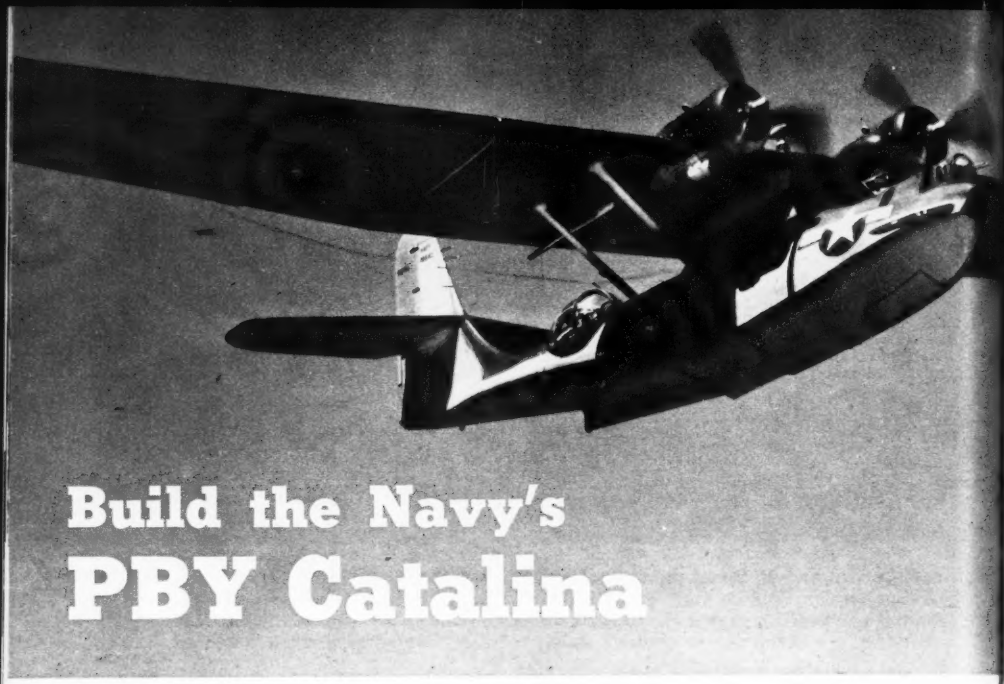
Auxiliary-Tool Hookup. If you own a Shopsmith, you can use its drive shaft to activate other power tools, thus saving money by not buying extra motors. Here, a jointer is coupled to a Shopsmith by V-belt and pulleys and is grounded to the Shopsmith's legs to carry off static electricity.

Substitute Coil. Carry an old ignition coil in the trunk of your car; then if the regular coil cracks and shorts the automobile's ignition, or otherwise fails, you can tape the spare coil to a radiator brace rod (which is usually conveniently placed), disconnect the wires from the shorted coil, and hook them to the emergency spark coil.



Economical Lettering. A clear plastic sheet that is lettered in reverse on its back and screwed in place will act as a push plate and prevent finger marks on a painted door stile. The plastic can be removed when the door is to be painted and replaced when the paint is dry. This eliminates costly relettering directly on the painted surface.





Build the Navy's PBY Catalina

IN the pages of aeronautical history, the Consolidated Vultee Catalina PBY will be recorded as one of the world's great aircraft. Although designed in 1933, Catalinas are still being used throughout the world.

The versatile, long-range flying boats were pressed into nearly every type of military service. Maximum speed of the PBY-5 is 195 mph and the average maximum cruising speed is 130 mph. Powered by 1,200 hp Pratt & Whitney engines, the Catalina has a cruising range of 3,000 miles. Wingspan is 104 ft., length is 63 ft. 11 in., and height is 18 ft. 11 in.

Some Catalinas were acquired after the war from surplus agencies for conversion into commercial passenger cargo aircraft. However, in order to obtain a very colorful replica, we selected the pre-war Catalina to be reproduced in model form. Mr. Fred E. Hamlin of Consolidated Vultee Aircraft supplied helpful photos and information for this project.

These planes were painted in many bright colors: silver, chrome, yellow, red, green, blue, white and black all on one airplane! When applied properly, these colors should attract any beauty-event judge.

The prototype was flown as both a landplane and seaplane very successfully. The model's tricycle landing gear is held in place with wood screws and is readily detachable. Note that a small balsa filler block is used in the bow to occupy the space normally closed by the nose wheel doors during seaplane operation. Most engines from .049 to .099 for landplane and .099 to .199 cu. in. displacement on water can be used.

It is suggested that the model be built as lightly as possible when powered with .049 engines (landplane flying). It takes a bit of experience to take off from water without sufficient power, so do not use the .049 for water flying. Although the wing tip floats on the full scale aircraft are retractable, we attached ours permanently in the lowered position. If you intend using your model as a landplane only, cement the float to the wing tip as the plans illustrate. These floats must be enlarged in seaplane flying, however, for water stability. Our model weighs 21½ ounces and is 1/36th the size of the prototype.

Your 160-square-inch wing area Catalina will provide much land and sea flying enjoyment and will certainly be the star attraction at the local model port.

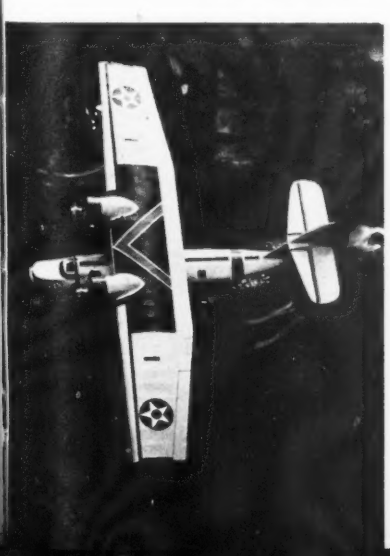
Cut the fuselage keel from $\frac{3}{16}$-in. medium-soft sheet and be sure to cut out space for the bellcrank. The $\frac{3}{32}$-in. medium-sheet bulkheads are now cut out

The rugged PBY is one ship that has really been put through the paces. It has served as a patrol plane, was widely employed in rescue work, and, in emergencies, has even taken on the role of a dive bomber! Make your own version of this amazing model in landplane, seaplane, or amphibian style.

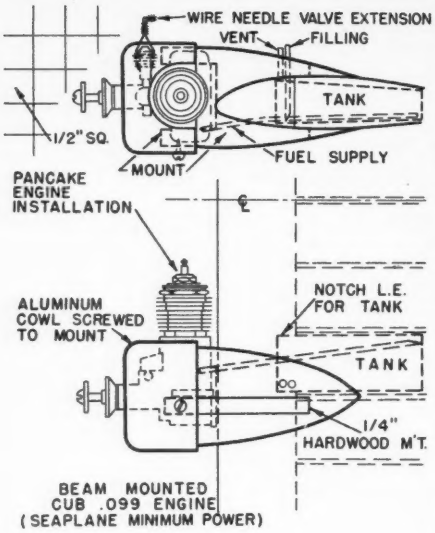
Control-line model of Navy's "Dumbo" uses .049 to .099 engines for landplane operation, .099 to .199 for amphib.

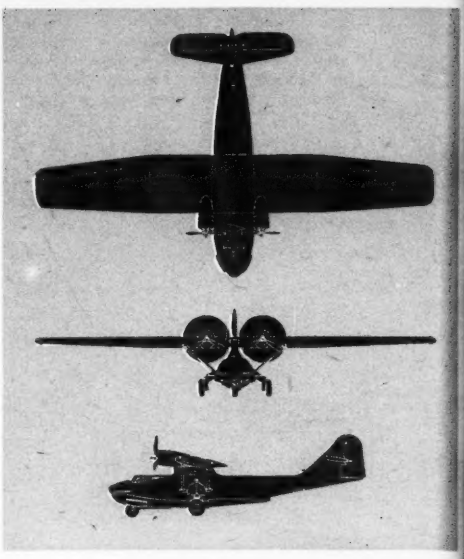
By Walter A. Musciano

and cemented to the keel. Care should be taken to cut notches for the landing gear supports and ¼-in.-square fairing strip before cementing the bulkheads in place. Cut the bellcrank support and cement firmly to the keel as shown. Now the elevator and stabilizer must be shaped and the elevator halves cemented to the dowel spar. Add the control horn and then hinge the elevator to the stabilizer with crinoline strips. When dry, the stabilizer is cemented to the keel and the control rod is bent to shape. Slide the control rod through the holes in the bulkheads and attach the ends to the horn and bellcrank. Solder a small brass washer to both ends of the control rod to prevent it from slipping off the horn or bellcrank. Before securing the bellcrank, attach the .015 lead-out lines to it. Either twist or solder the ends to prevent them from disengaging from the bellcrank. Using plenty of cement, attach the two



Left: A true amphib, our model takes to water like its versatile prototype. Builder Musciano, below, makes a minor adjustment in preparation for a flight.





hardwood main wheel foundations and the plywood nose wheel support firmly to the structure.

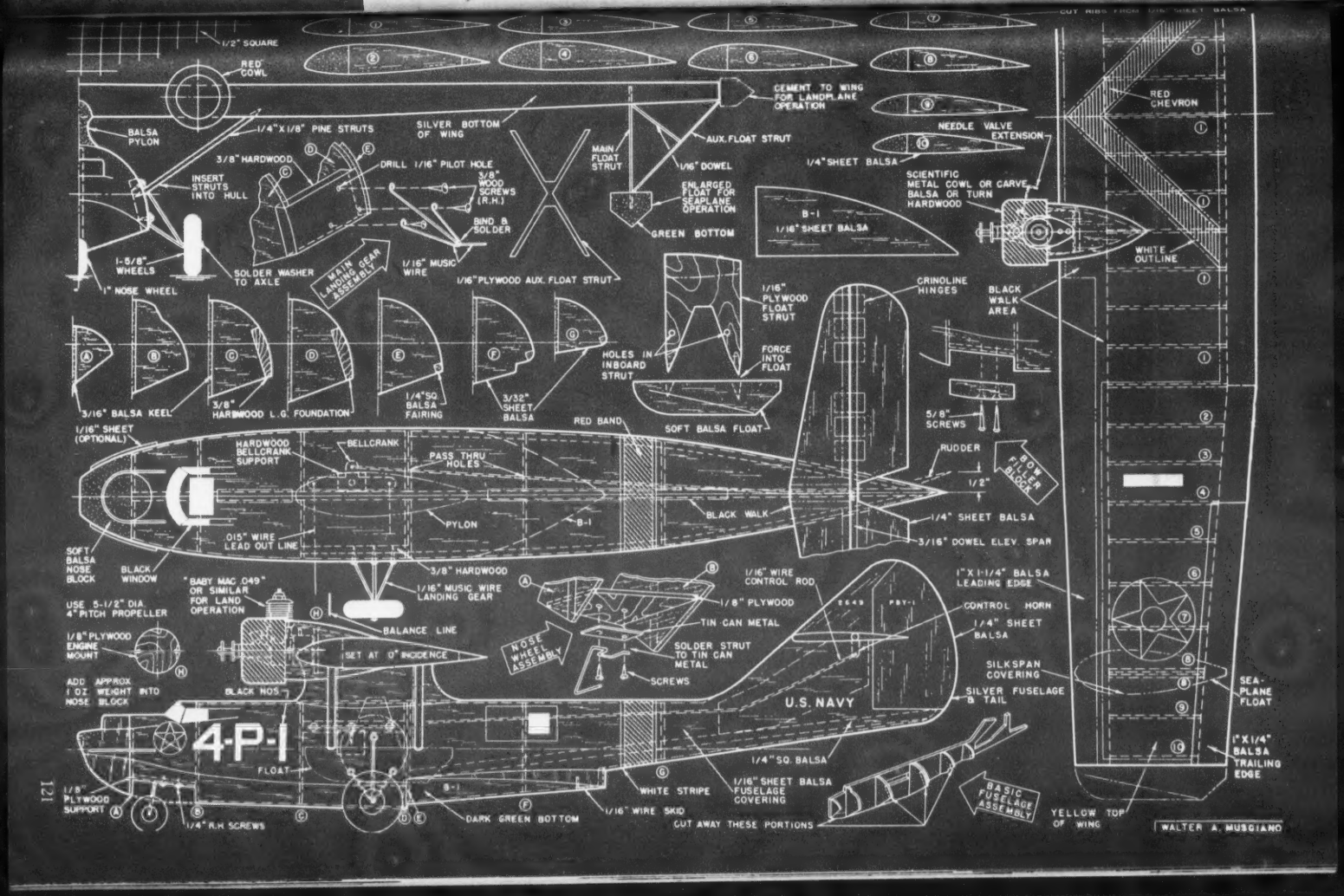
Fuselage-hull covering is next. It is advisable to complete the sheet bottom and top and then fill in the sides and miscellaneous areas with planking strips. Select a medium soft straight-grained $\frac{1}{16}$x3-in. sheet and cement it to the very top of the fuselage. Bend it around the hull and hold it in place with straight pins forced into the bulkheads. This piece should extend from bulkheads B to G. Now cut two units of piece B-1 and cement to the hull bottom. This is followed by the forward portion of the hull bottom which is also sheet covered. It is suggested that this piece be cemented in place first and trimmed to shape when dry.

The fin sides are $\frac{1}{16}$-in. sheet covered at this time. Use $\frac{1}{16}$x¼-in. strips to plank the remaining fuselage openings. These include the bottom aft of bulkhead E and the sides of the hull below the previously mentioned $\frac{1}{16}$x3-in. top sheet cover. Carve the nose block [*Continued on page* 158]

FULL-SCALE PLANS

will greatly simplify construction. Send fifty cents to MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Connecticut. Please specify Plan No. 434.

Aloft, afloat, or ashore, this colorful replica is a potential prize winner.


1/2" SQUARE
RED COWL
BALSA PYLON
1/4"X1/8" PINE STRUTS
SILVER BOTTOM OF WING
CEMENT TO WING FOR LANDPLANE OPERATION
AUX. FLOAT STRUT
MAIN FLOAT STRUT
1/16" DOWEL
ENLARGED FLOAT FOR SEAPLANE OPERATION
GREEN BOTTOM
3/8" HARDWOOD
DRILL 1/16" PILOT HOLE
3/8" WOOD SCREWS (R.H.)
BIND & SOLDER
INSERT STRUTS INTO HULL
1-5/8" WHEELS
1" NOSE WHEEL
SOLDER WASHER TO AXLE
MAIN LANDING GEAR ASSEMBLY
1/16" MUSIC WIRE
1/16" PLYWOOD AUX. FLOAT STRUT
1/4" SHEET BALSA
NEEDLE VALVE EXTENSION
SCIENTIFIC METAL COWL OR CARVE BALSA OR TURN HARDWOOD
B-1
1/16" SHEET BALSA
RED CHEVRON
WHITE OUTLINE
1/16" PLYWOOD FLOAT STRUT
HOLES IN INBOARD STRUT
FORCE INTO FLOAT
GRINOLINE HINGES
BLACK WALK AREA
3/16" BALSA KEEL
3/8" HARDWOOD L.G. FOUNDATION
1/4"SQ. BALSA FAIRING
3/32" SHEET BALSA
1/16" SHEET (OPTIONAL)
RED BAND
SOFT BALSA FLOAT
5/8" SCREWS
HARDWOOD BELLCRANK SUPPORT
BELLCRANK
PASS THRU HOLES
RUDDER
BOW FILLER BLOCK
1/2"
PYLON
BLACK WALK
1/4" SHEET BALSA
3/16" DOWEL ELEV. SPAR
SOFT BALSA NOSE BLOCK
BLACK WINDOW
.015" WIRE LEAD OUT LINE
3/8" HARDWOOD
"BABY MAC .049" OR SIMILAR FOR LAND OPERATION
1/16" MUSIC WIRE LANDING GEAR
1/16" WIRE CONTROL ROD
1/8" PLYWOOD
TIN CAN METAL
1"X1-1/4" BALSA LEADING EDGE
CONTROL HORN
1/4" SHEET BALSA
USE 5-1/2" DIA. 4" PITCH PROPELLER
1/8" PLYWOOD ENGINE MOUNT
BALANCE LINE
SET AT 0° INCIDENCE
NOSE WHEEL ASSEMBLY
SOLDER STRUT TO TIN CAN METAL
SCREWS
SILKSPAN COVERING
SILVER FUSELAGE & TAIL
ADD APPROX. 1 OZ WEIGHT INTO NOSE BLOCK
BLACK HOS
U.S. NAVY
4-P-1
SEA-PLANE FLOAT
1"X1/4" BALSA TRAILING EDGE
FLOAT
1/4"SQ. BALSA
1/8" PLYWOOD SUPPORT
1/4" R.H. SCREWS
B-1
DARK GREEN BOTTOM
WHITE STRIPE
1/16" WIRE SKID
1/16" SHEET BALSA FUSELAGE COVERING
CUT AWAY THESE PORTIONS
BASIC FUSELAGE ASSEMBLY
YELLOW TOP OF WING
WALTER A. MUSGIANO

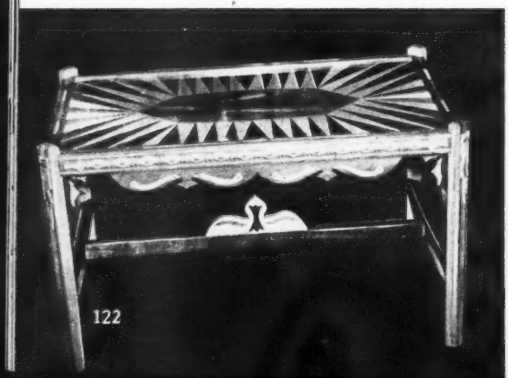
Catch-all tractor, assembled by Cyril Kehrer, New Memphis, Ill., includes among its parts a converted motorcycle gear, auto and truck wheels, and a four-cycle engine.

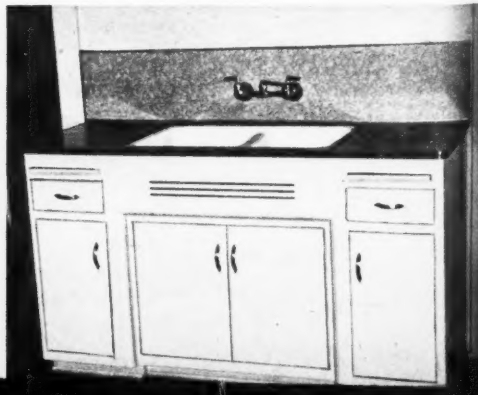
mi WORKBENCH AWARD WINNERS

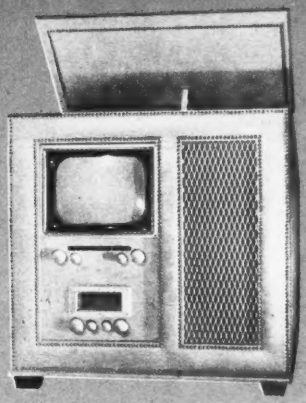
Each craftsman whose project is shown here receives a $5 check and a Workbench Award Certificate. How about sending us a photo and description of your latest project? If you aren't a winner, you may still receive a Certificate Of Merit. Photographs of your workshop are also eligible for an award. Send entries to *Mechanix Illustrated* Workbench Awards, 67 West 44th Street, New York 18, New York.

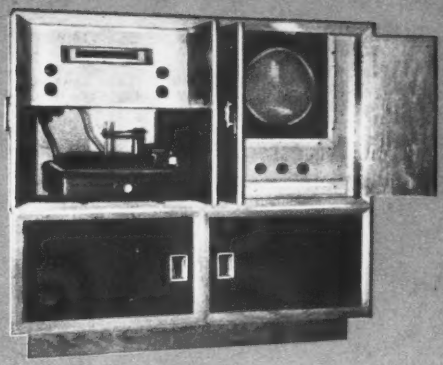
Lowly scraps of Cabinetmaker John Kutz of Buffalo, N. Y., were salvaged and combined into a coffee table. Top alone has 156 pieces of inlaid walnut, mahogany, cherry, birch, and maple, each $\frac{3}{16}$ in. thick. Most of the work was done by hand.

Smart sink unit is the work of Stephen Marynik, Montebello, Calif. Lumber is ¾-in. pine, with the exception of plywood doors. Top surface was covered with Formica, and steel trim was used throughout. Steve installed the plumbing, too.





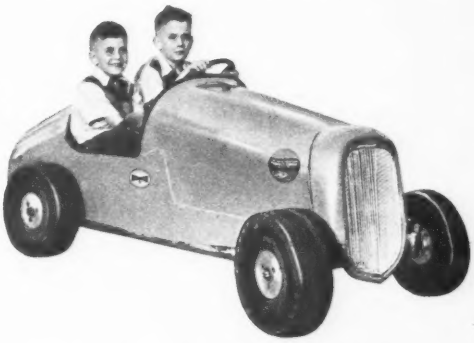




Upholstered console houses a 16-in. TV screen, an AM-FM tuner, a record changer, amplifier and speaker. E. Carlton Winford, Dallas, used a plywood frame which he covered with gray plastic. Latter was secured with well over 1,000 tacks.

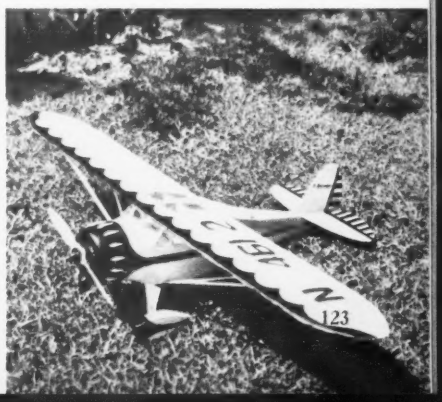
The Air Force hobby shop at Selma, Ala., must be quite complete, for its facilities enabled Capt. H. W. Finley to complete this combination console unit. He used ¾-in. plywood, which was finished blonde. Note circular TV screen at the upper right.

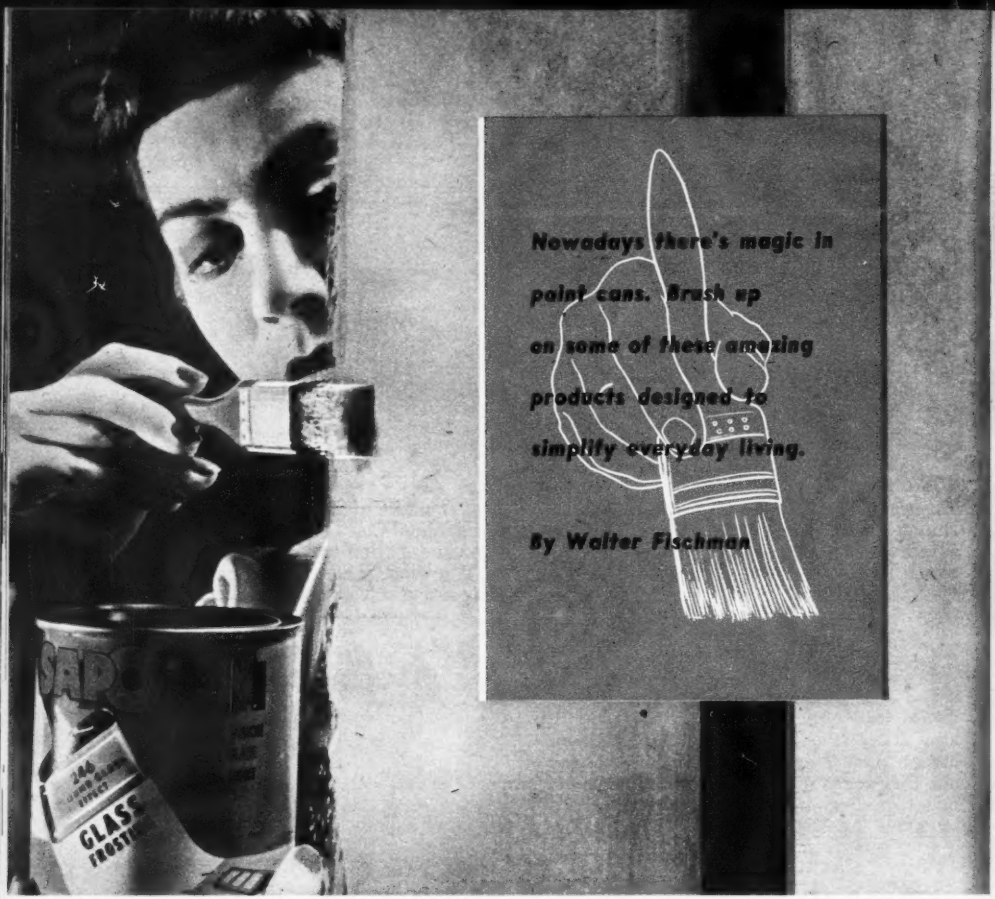
Four months were required to make Skip and Gary Yetter the luckiest kids in Macon, Ga. Their Dad, George, knocked out this roadster in that amount of time. Specs: a 45-in. wheelbase; power supplied by a 1½-hp Briggs and Stratton engine.



Moppet, MI Plan No. B-182, continues to be a best seller. This version, built by Cyril Luce, Toronto, employs a 2¼-hp motor. A steering wheel cut from plywood was made as an additional feature. A first attempt at boatbuilding, Moppet cost $55.

Model Monocoupe is the project of Bill Thomas, Washington, D. C. Powered by an Ohlsson and Rice .29 engine, the plane has already had several successful flights. It was finished with twenty coats of red and white dope, plus several coats of lacquer.





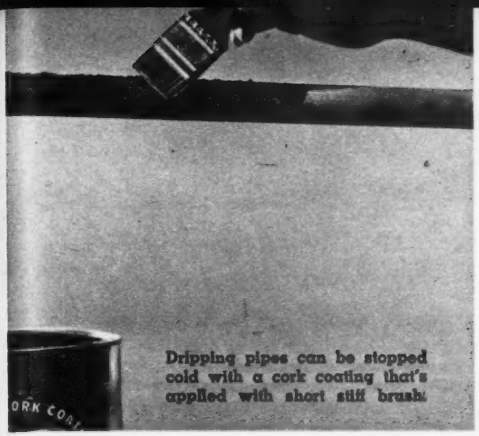
A few brush strokes, plus special glass-frosting paint, are all you need to transform any pane into a frosted surface that is translucent, yet glare and stareproof.

special paints for

TODAY'S world is rapidly becoming one of specialization. Hardly a day passes without the announcement of a new drug, metal, fabric or plastic, each designed to meet just one specific purpose. In the light of this, it's not strange that paint manufacturers have turned specialists themselves.

They have come to realize that more and more homeowners are doing their own work. Other factors are pressuring the change. Out of the laboratories have come a host of new products. Hand in hand with them have come maintenance problems. Before the development of plywood, who needed plywood paints?

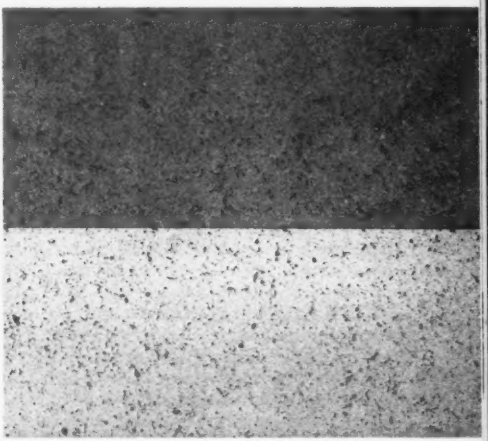
Also, the style of living in America has changed. Grandma's basement was clean and neat. Once or twice a year she had it whitewashed. The basement today? It's a table tennis court, a social center for the kids, and provides space for comfortable parties. Whitewash is out. Rough interior walls must now be finished differently. It's not enough that they be clean; they must now be covered in decorator colors and



Dripping pipes can be stopped cold with a cork coating that's applied with short stiff brush.

You are probably already familiar with auto touch-up paint, but have you told Junior that it's ideal for his bike, too?

The lowly radiator, once confined to metal paint exclusively, can now be finished in a variety of colors which are heat resistant and won't peel.



The gag about polka dot paint is obsolete—for two-tone paint is a reality. The colors don't mix, but dry singly. Two samples are shown above.

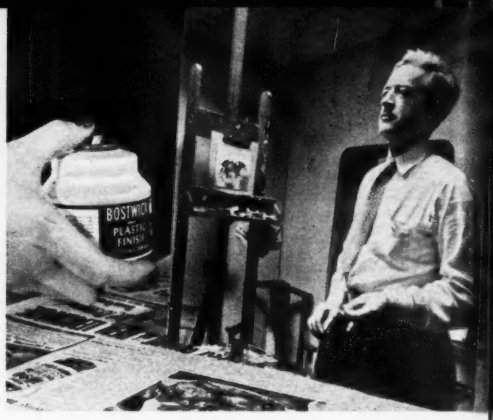
special purposes

the paint must also keep the dampness out. The manufacturers have obliged.

Nowadays there's no more half guessing. Will the paint for the bathroom walls also do the trick for the cement floor and the garden furniture? Today there are special paints for garden furniture, special paints for cement and special enamels for bathrooms.

Insurance companies and civic fire authorities have long been searching for some surface coating that would retard the spread of flames. New paints like Albi-R or Flame-Seal appear to have the answer. Applied in two coats to the surface, they marshmallow out when fire strikes to form puffy, fire retardant coatings that give amazing protection to the wood underneath. While emphasizing that they are fire retardant, not fireproof, the manufacturers say the paints slow up the spread of the fire long enough so that: (1) you will have sufficient time in which to escape; (2) valuable possessions can be saved, and (3) the firemen can have a chance to arrive and go to work before the fire has

Waterproof rubber base enamel enables you to paint flagstone walks, concrete steps, etc. It resists heavy traffic, scrubbing, and weather.



Colorless plastic finish, excellent for preserving valuable papers, photographs, and even metalware, comes in a handy spray-bomb container.

taken too great a toll. In test applications, small wooden buildings coated with these substances have been filled with gasoline-soaked firewood and ignited. Hours later when the last of the flames had died out, the buildings were partially charred but still intact and usable.

A favorite material of most basement craftsmen is plywood. Cheapest and most popular has been fir plywood, but the big problem has been taming the wild grain so that it won't bleed through the finish. Firzite, a new type of wood filler, is guaranteed to lick almost any grain.

There are many places in your home where a little blackboard would come in handy. Instead of wrestling with an unwieldy hunk of natural slate, the housewife can get out the paint brush and a can of Blackboard Slating. Two or three coats on any smooth surface will make a blackboard that will take chalk, and it can be wiped clean or sponged down when necessary.

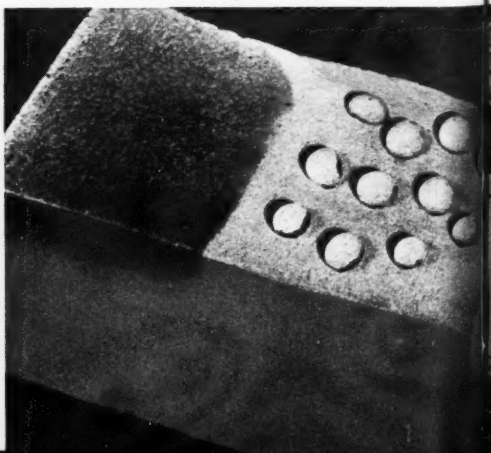
Radiators are another example of paint specialization. Just picture Mrs. Housewife scanning the magazines for attractive decorating schemes, and then confronted with the problem of not being able to put the same or a complementary color on both her radiators and her walls.

This is solved with a new radiator and range enamel put on the market by Sapolin. Available in many colors, it is completely heat resistant and won't crack, peel or discolor. If your range is well insulated, you can use it on that, too.

As far back as Sinbad's time, sailors have been faced with the problem of barnacles, sea growths, and other organisms that can damage, if not wreck, their ships. Recently the development of vinyl resins have speeded the solution of this ancient problem. Woolsey Vinelast paints

Make yourself a blackboard by applying one of several brands of special paint to a plywood panel. These "slates" can be sponged after use.

The right half of this brick has been treated with a silicone waterproofing agent which may be used on asphalt shingles, cinder blocks, etc.



Canvas sails sprayed by salt water are subject to rot and disintegration. Special solution will protect canvas on land or on sea for a season.

Metal test panel was painted with manufacturer's monogram, then submerged in tropical waters for a year. Barnacles grew only on unprotected area.

on boat bottoms give anti-fouling protection for an entire season or longer.

Phil Phixit had a paint problem. He always made his garden look like a private Eden come each May. However, the job involved was terrific, especially when it came to his fences and trellises. No matter what he did, they would slowly rot. The dampness of the ground hurried the process along, but the borers and wood-destroying insects worked at top speed. Mr. Phixit hied himself down to the paint store and came back with a can of Woodlife, a wood preservative. This specialized paint gave his fence posts a longer lease on life.

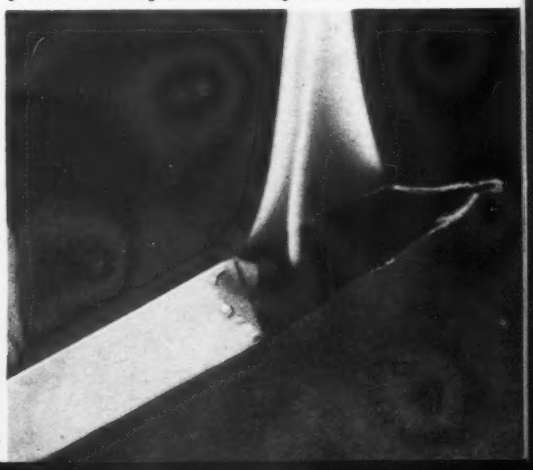
The story was the same with Phil's cement cellar floor. The damp concrete would always chip and peel ordinary paints, and the expense of doing the cellar over almost every year made Phil feel like hitting his head against the same floor.

Finally he told his problem to his paint dealer. The dealer hauled out a can of a new rubber-based waterproof enamel that withstands the onslaught of stamping feet and rough wear, but still retains the same resilient and wearing qualities of rubber. These paints are known on the market as Stone Dri, Lipton All-Seal Waterproofing, or Luminall. Some come in a variety of colors so that your cellar floor and walls can now look like something more than the exercise pen in a prison yard.

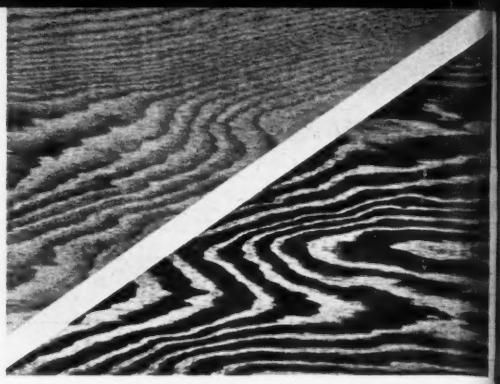
Scratches in the paint of your auto body do more than just detract from the looks of the car. They are an invitation to rust. But there's a way out of this morass and it comes in a can with a paint brush. It's called Du Pont touch-up paint and is available in an endless array of colors to match the exact tint or shade on almost every automobile. It's a natural, too, for bikes. Along with auto enamel is a chrome

The life span of this rotting, termite-infested fence post could have been greatly increased if it had been first treated with wood preservative.

Fire retardant paint is applied in two coats. When fire occurs, it marshmallows out, forming protective coating that retards spread of flames.



Tough, durable furniture finishes are a welcome arrival. This one is versatile enough to be used on a sink unit, which undergoes constant wetting.



Many craftsman shy away from fir plywood because of the wild grain that bleeds through a natural finish. Top panel was treated with Firzite.

Both of these test floors were exposed to the weather for five years. Neither was painted. Floor at left was treated with preservative, Woodlife.

paint that matches the original finish on bumpers and such accessories as spotlights, fog lights, etc.

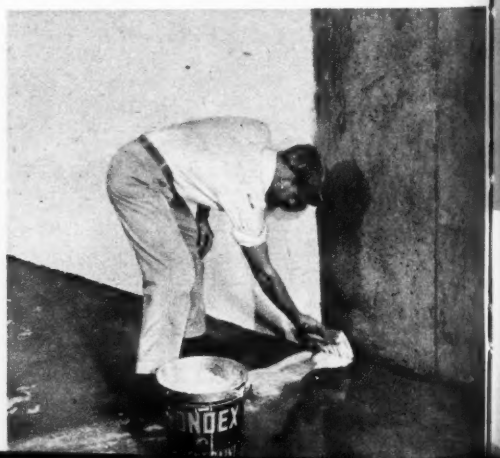
Luminous paint that soaks up light during the day and glows with a soft light in the dark has many handy uses about a house. No more fumbling for light switches if they are coated with such luminus paints as Flasho, Stroblite, Sapolin, Worth, or Glo-Lite. Dark cellar steps can cease to be a hazard if there is a glowing outline of the treads and risers.

Through the miracle of paint, new beauty and durability have been added to linoleum. Available in a clear finish or in colors, Lino-Lux gives a protective surface to new linoleum or adds years to the life of old faded floor covering. For the housewife there's a leisure dividend in an easy-to-clean surface that requires less scrubbing.

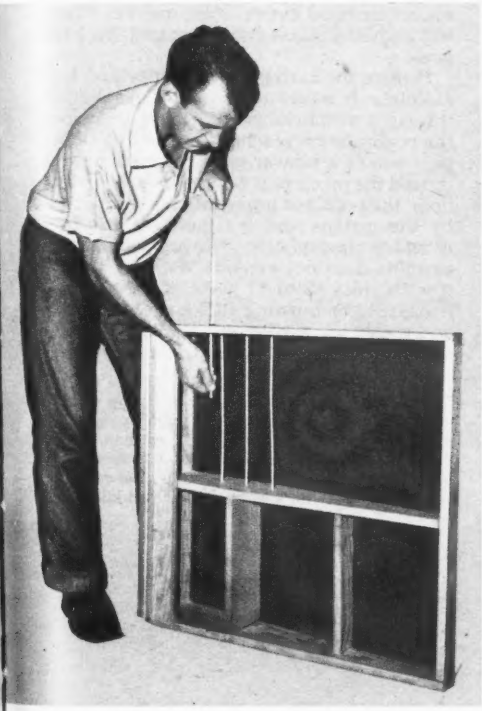
Paints that will make leather or simulated leather fabrics look like new are another recent [*Continued on page* 177]

Leather renewer is brushed onto the article you wish to treat. It restores a polish that could formerly be obtained only after laborious running.

Damp and sweating basement walls can be held in check by applying a paint devised for this specific purpose. It comes in several colors, too.



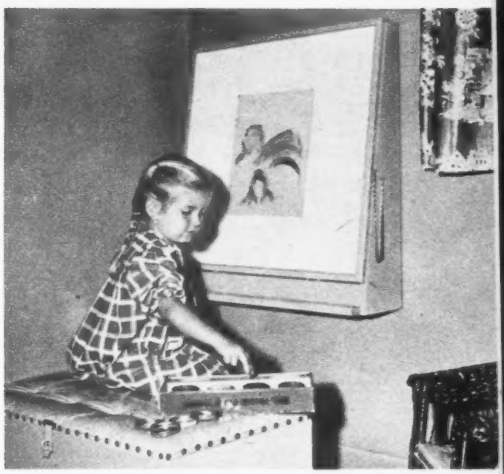
For finger painting or water coloring, pin paper to the fiberboard face; for writing or drawing, drop the desk front and use the plywood surface.



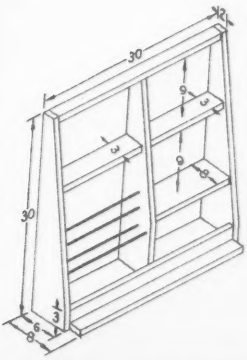
To hold books and magazines, retainers made from dowels are pushed through undersize holes. This method makes replacement of broken dowels easy.

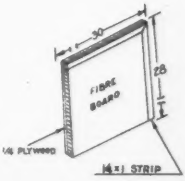
WALL DESK

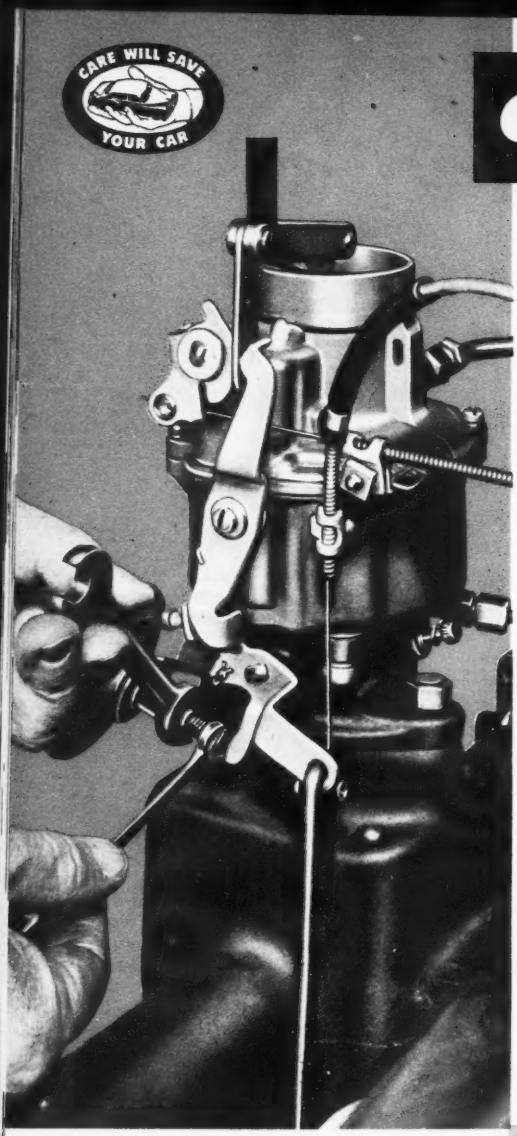
If you have a child who's at the finger-painting and coloring age, make this desk. It takes up little space and the material cost is under $6.



THIS desk should win you an extra hug from your adoring child. Make the front from fiberboard and plywood, bonding them together with linoleum paste and framing with stripping secured with wire brads. For the desk proper, use ¾-in. shelving. Cutting the sides to the slope indicated eliminates any need for locking devices. Countersink and putty over all fastenings, then finish the desk to match your walls.—*E. W. Miller* •







car care

The Carburetor

ADMITTEDLY the carburetor is a complicated unit, but fortified with a few facts and without the bravado of a "Who's afraid of the big bad wolf?" attitude any car owner can keep this vital unit of the engine in much better working condition. However, we must differentiate between "care" and "repair." Special tools, and considerable know-how, are required to rebuild carburetors, or even to replace some of their parts. Care of the carburetor, on the other hand, is within the scope of the owner who wants to get better performance, increased gas mileage, quicker starting and longer life from its parts. So here goes.

Picture the carburetor as a glorified fuel atomizer. It mixes air with raw gasoline in the right proportions, and heats it, before the combination reaches the cylinders. Except where a blower type of supercharger is used the mixture is sucked into the cylinders, the result of a partial vacuum caused by the pistons and the fact that the fuel is under atmospheric pressure. Since pure gasoline does not explode we have to mix it with from 13 to 17 parts of air to make it capable of burning furiously enough to constitute an explosion. That carburetor on your car has [*Continued on page* 152]

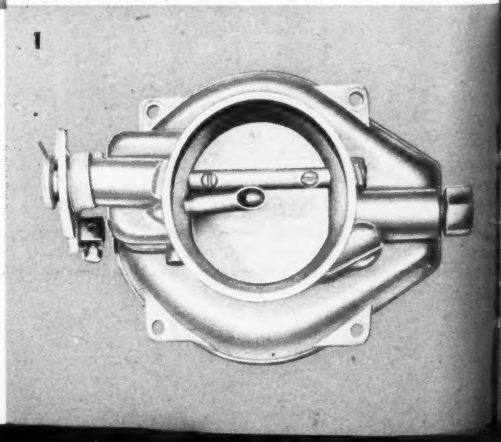
Left: A torque converter has a tendency to stall the motor when stopping from high speed. Two wrenches and .090 feeler gauge are being used on this GM carburetor to adjust the throttle return. The gauge should be inserted between the carburetor choke lever cam and the fast idle lever.

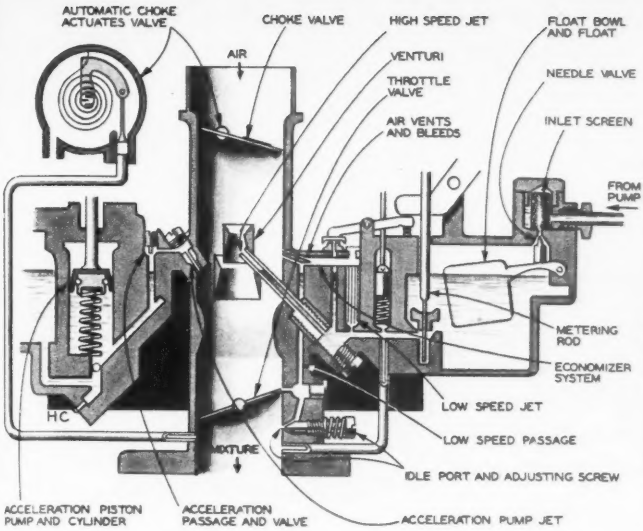
1 The choke valve is located in the air horn, just below the point where the air cleaner is attached. It may be affected if the wing nut on the air cleaner is tightened too much.

2 Vents for the float bowl may be internal, or external as in the Rochester carburetor. Make sure they are clear at all times.

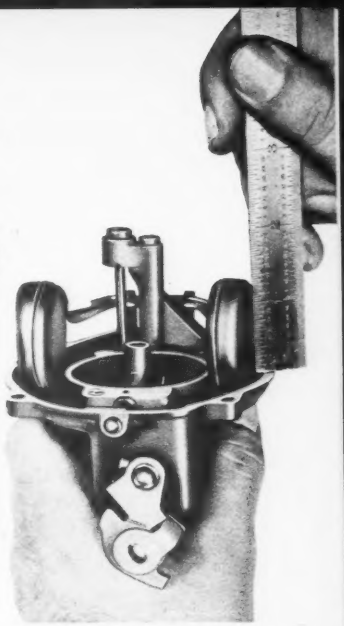
3 Float adjustments are made by carefully bending the float arms or lips. Clearance between the float and the wall of the bowl may be extremely close on some models.

1

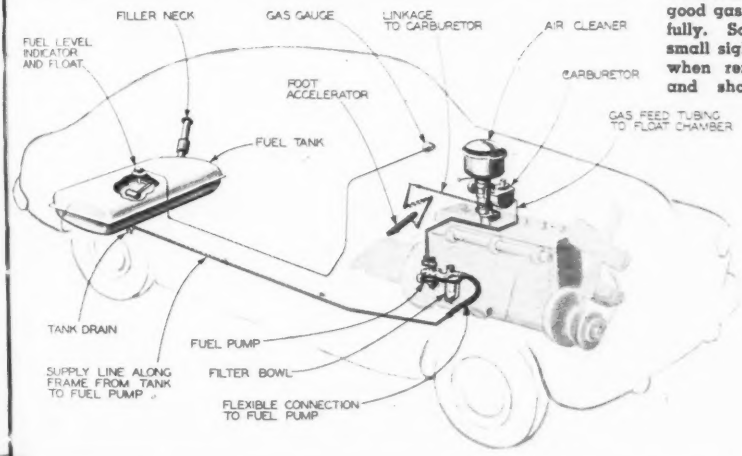




SCHEMATIC DIAGRAM SHOWS HOW CARBURETOR CHANNELS CONTROL GAS FLOW



Correct float level is important for good gas mileage. Measure carefully. Some carburetors have small sight plugs in bowl, which when removed reveal gasoline and show its actual height.



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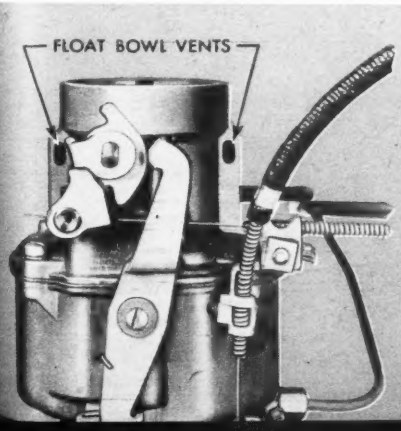

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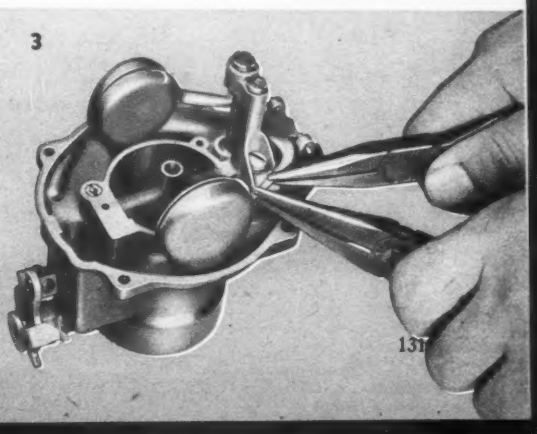
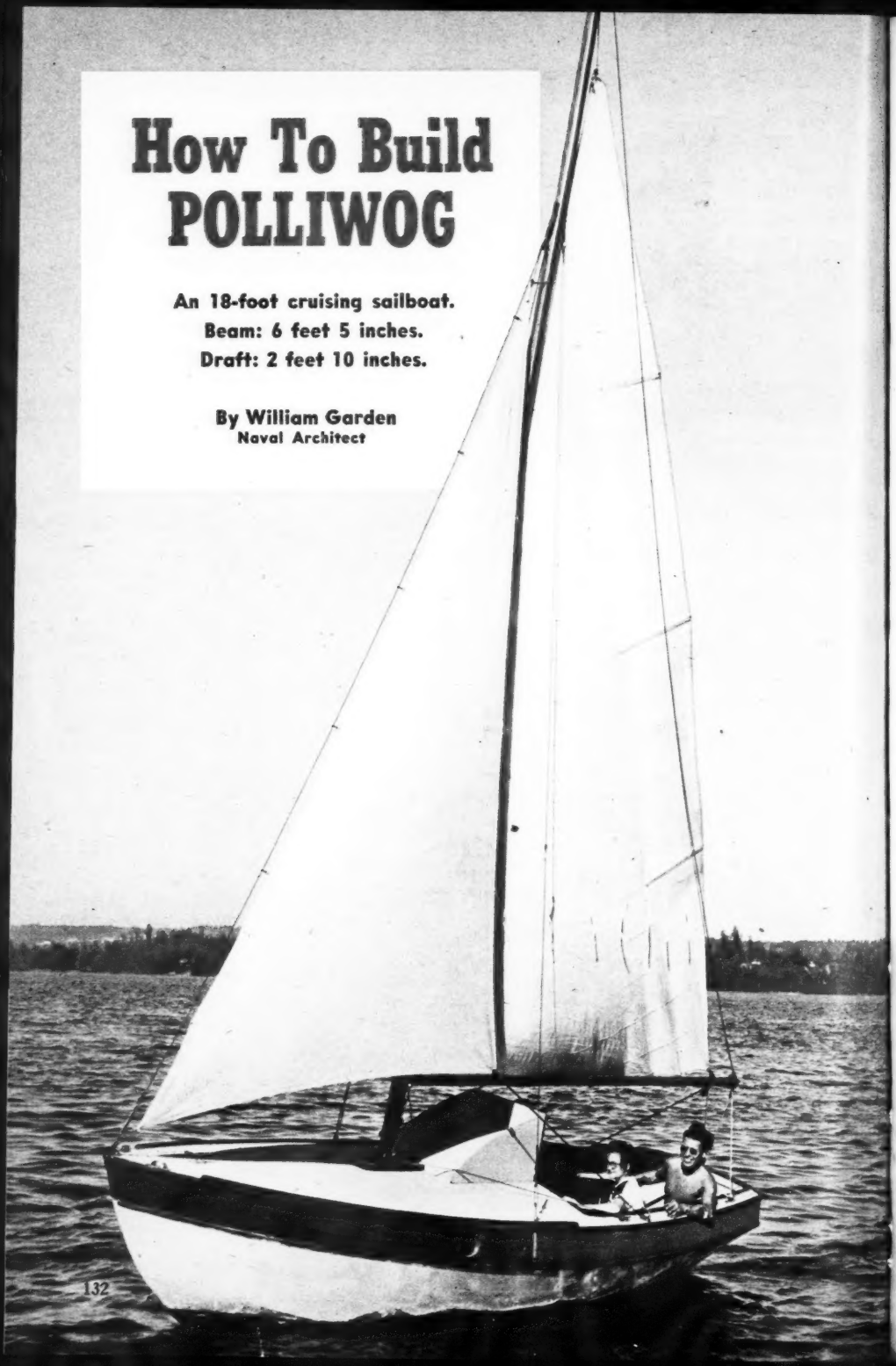
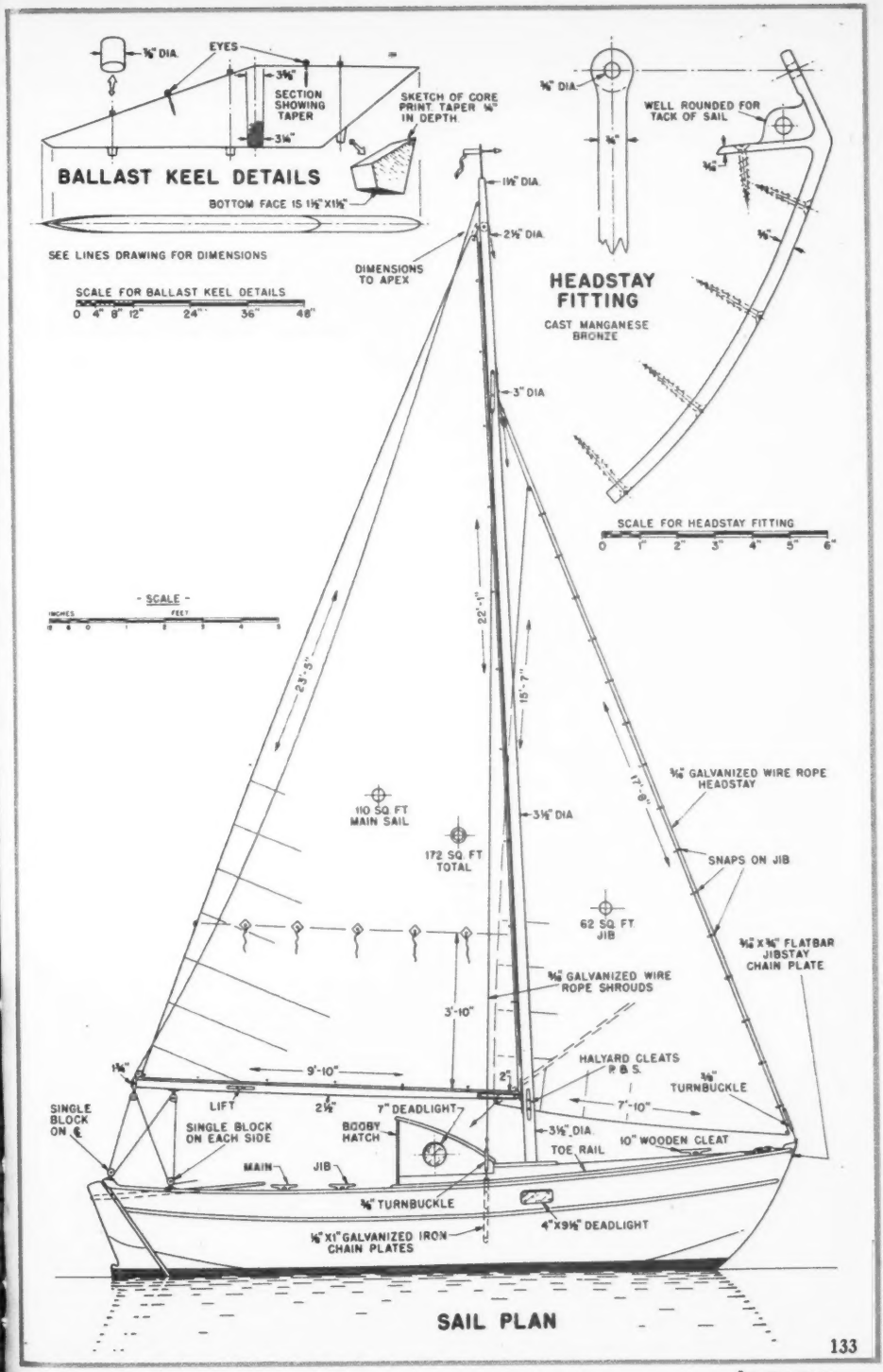


How To Build POLLIWOG

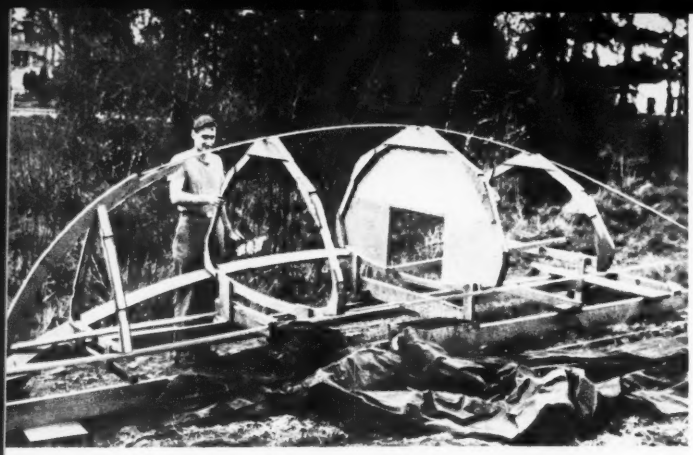
An 18-foot cruising sailboat.
Beam: 6 feet 5 inches.
Draft: 2 feet 10 inches.

By William Garden
Naval Architect




BALLAST KEEL DETAILS
EYES
SECTION SHOWING TAPER
SKETCH OF CORE PRINT TAPER ¼" IN DEPTH
BOTTOM FACE IS 1½" X 1½"
SEE LINES DRAWING FOR DIMENSIONS
SCALE FOR BALLAST KEEL DETAILS
0 4" 8" 12" 24" 36" 48"
HEADSTAY FITTING
CAST MANGANESE BRONZE
WELL ROUNDED FOR TACK OF SAIL
SCALE FOR HEADSTAY FITTING
0 1" 2" 3" 4" 5" 6"
DIMENSIONS TO APEX
- SCALE -
INCHES
FEET
110 SQ FT MAIN SAIL
172 SQ FT TOTAL
62 SQ FT JIB
⅜" GALVANIZED WIRE ROPE HEADSTAY
SNAPS ON JIB
⅜" X ⅜" FLATBAR JIBSTAY CHAIN PLATE
⅜" GALVANIZED WIRE ROPE SHROUDS
HALYARD CLEATS P & S.
⅜" TURNBUCKLE
SINGLE BLOCK ON ℄
SINGLE BLOCK ON EACH SIDE
LIFT
7" DEADLIGHT
BOOBY HATCH
10" WOODEN CLEAT
TOE RAIL
MAIN
JIB
⅜" TURNBUCKLE
4" X 9½" DEADLIGHT
⅜" X 1" GALVANIZED IRON CHAIN PLATES
SAIL PLAN

turn page



Polliwog is built upside down. Here, the stem and the four sawed frames are in place on the harpings. Stern will be added next.

POLLIWOG was designed for young people who love cruising. Lively under sail and roomy on deck and below, she's a good type to acquire when thoughts of a voyage of exploration begin pushing aside studies and other trifles. While she is but 18 feet long (the size of the usual day-sailer), she has adequate depth and enough outside ballast to enable her to make coastwise passages in safety—and for exploring, the draft of less than three feet is ideal.

For auxiliary power, we suggest installing a one-cylinder, four or five-hp marine engine. Several manufacturers make such engines. Among them are the Kermath Manufacturing Co., Detroit 8; the Nadler Foundry and Machine Co., Inc., Plaquemine, La.; and Palmer Bros. Engines, Inc., Cos Cob, Conn.

The layout in the snug cuddy cabin has been kept simple to allow maximum use of the available room. A piece of netting runs along each side for stowing clothes and gear. A couple of air mattresses on the flooring are ideal for sleeping or lounging. Two shelves at the forward end of the cabin take cooking utensils and food. The cockpit is long enough so that it can be converted into an extra sleeping location by rigging a tent over the boom.

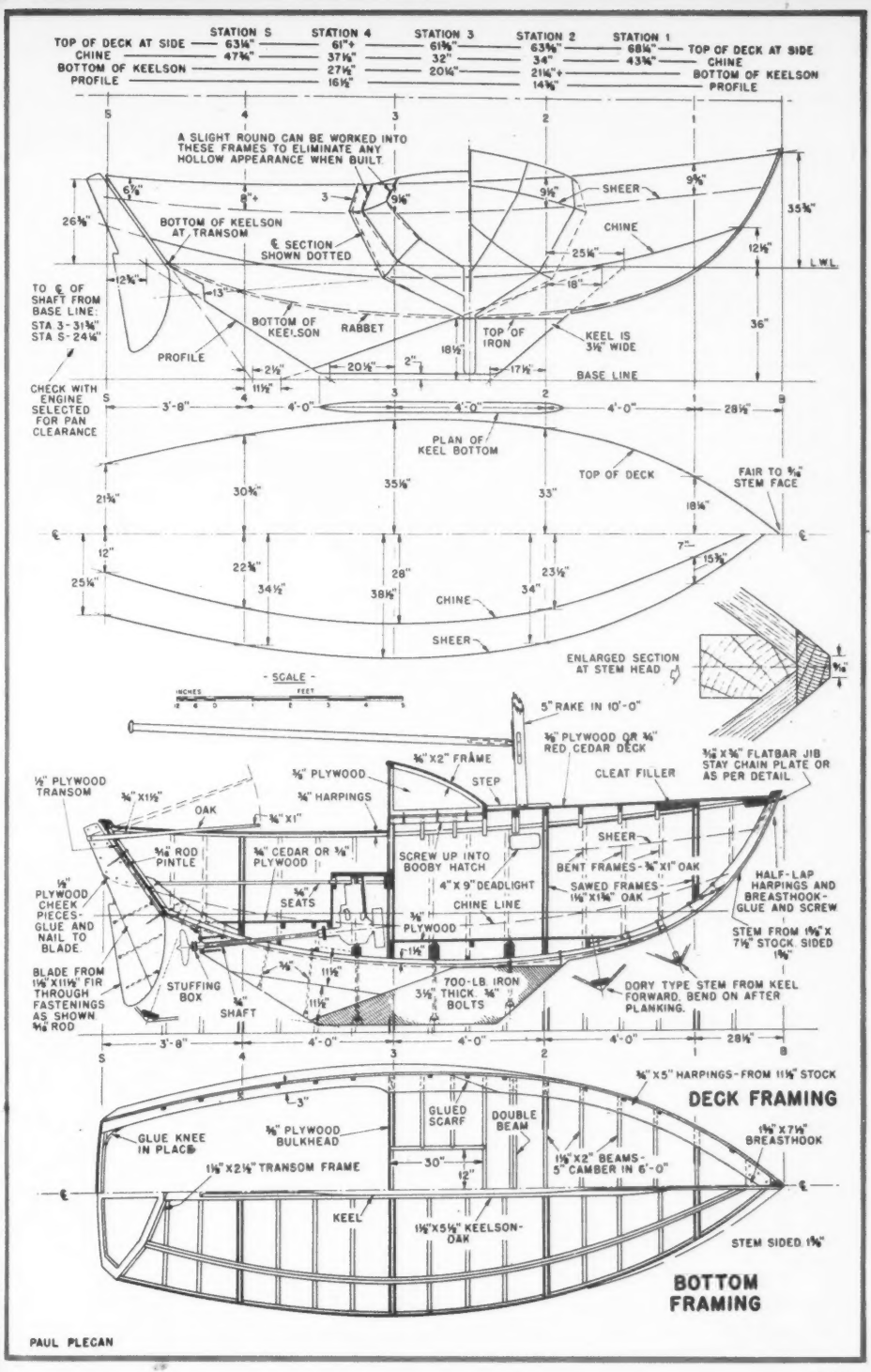
Construction is not too difficult. After a little study and thought, the general method of procedure will become apparent. Since standard boatbuilding operations are followed, no specific instructions are needed. We advise you to get a good book on boatbuilding, such as Monk's *Modern Boatbuilding* or Steward's *Small Boat Construction,* for answers to the problems that will come up on the job.

All oak specified in the Lumber List as being bending oak should be green when purchased; it is impossible to impart very much bend to oak that has been dried. The hull is built on four sawed frames with small intermediate frames bent in between. Since sawed frames are ticklish to get right (they require beveling and exact work to make the boat fair up), we have kept them to a minimum. The intermediate frames can be bent in hot after the planking is on.

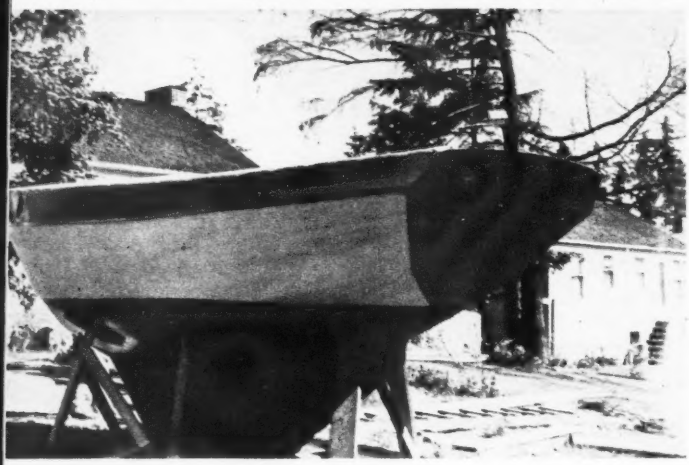
The ballast keel will require a pattern so the foundry can make it the right size. Cut the stock up into several pieces, glue and fasten them together, and fair off the forward and after ends as shown on the lines drawing. Mark the locations of the bolts on the top and bottom to spot the cores. Be sure to plane a slight taper from top to bottom and screw two eyebolts in the top so the pattern can be pulled out of the sand. Finish the pattern by carefully sanding it smooth.

The photos show the boat being built upside down. By going at the job in this manner, the planking is easier to work and most fastenings are driven at a downward rather than an upward angle. After Polliwog is planked, bore the keel-bolt holes; then get a gang together and turn the boat rightside up onto her iron keel.

Make the mast and boom from spruce or fir. Spruce spars are preferable because they are lighter and better looking. For fir spars, find a stand of timber where the young trees are bunched so they have had to grow straight to get to sunlight. Cut one that's about 4½ in. in diameter and another 3½ in. in diameter. For best results, they should be cut in January, when the sap is down. Skin off the bark, rub some tallow on the exposed wood to slow the drying process, and put the sticks out of the sun in a shed or some other cool place to dry for about three months. Then plane them down to the right diameters by first squaring,


STATION S
STATION 4
STATION 3
STATION 2
STATION 1
TOP OF DECK AT SIDE
CHINE
BOTTOM OF KEELSON
PROFILE
A SLIGHT ROUND CAN BE WORKED INTO THESE FRAMES TO ELIMINATE ANY HOLLOW APPEARANCE WHEN BUILT
SHEER
CHINE
BOTTOM OF KEELSON AT TRANSOM
℄ SECTION SHOWN DOTTED
LWL
TO ℄ OF SHAFT FROM BASE LINE:
STA 3 - 31¾"
STA S - 24¼"
BOTTOM OF KEELSON
RABBET
TOP OF IRON
KEEL IS 3½" WIDE
PROFILE
BASE LINE
CHECK WITH ENGINE SELECTED FOR PAN CLEARANCE
PLAN OF KEEL BOTTOM
TOP OF DECK
FAIR TO ⅝" STEM FACE
CHINE
SHEER
ENLARGED SECTION AT STEM HEAD
- SCALE -
INCHES
FEET
5" RAKE IN 10'-0"
⅜" PLYWOOD OR ¾" RED CEDAR DECK
¾" X 2" FRAME
STEP
CLEAT FILLER
⅜" X ⅜" FLATBAR JIB STAY CHAIN PLATE OR AS PER DETAIL
½" PLYWOOD TRANSOM
¾" X 1½"
OAK
¾" X 1"
⅜" PLYWOOD
¾" HARPINGS
⅜" ROD PINTLE
¾" CEDAR OR ⅜" PLYWOOD
SCREW UP INTO BOOBY HATCH
SHEER
BENT FRAMES - ¾" X 1" OAK
½" PLYWOOD CHEEK PIECES - GLUE AND NAIL TO BLADE
SEATS
4" X 9" DEADLIGHT
CHINE LINE
SAWED FRAMES - 1½" X 1½" OAK
HALF-LAP HARPINGS AND BREASTHOOK - GLUE AND SCREW
⅜" PLYWOOD
STEM FROM 1⅝" X 7½" STOCK SIDED 1⅝"
BLADE FROM 1½" X 11½" FIR THROUGH FASTENINGS AS SHOWN ⅜" ROD
STUFFING BOX
¾" SHAFT
700-LB. IRON 3½" THICK ¾" BOLTS
DORY TYPE STEM FROM KEEL FORWARD. BEND ON AFTER PLANKING.
¾" X 5" HARPINGS - FROM 11½" STOCK
DECK FRAMING
GLUE KNEE IN PLACE
⅜" PLYWOOD BULKHEAD
GLUED SCARF
DOUBLE BEAM
1⅝" X 7½" BREASTHOOK
1½" X 2¼" TRANSOM FRAME
1½" X 2" BEAMS - 5" CAMBER IN 6'-0"
KEEL
1½" X 5½" KEELSON - OAK
STEM SIDED 1⅝"
BOTTOM FRAMING
PAUL PLECAN

With planking completed and deadwood in place, Polliwog is ready to be flopped over and bolted to her iron keel, which is positioned nearby.



Here is the completed hull. If you want a boat that will last, apply at least three coats of best-grade marine finish to exterior of the hull.

Large-Scale Plans

will simplify building. Please specify Plan No. B-210 and forward $3 to MECHANIX ILLUSTRATED Plans Service, Fawcett Bldg., Greenwich, Conn.

then cutting to eight sides, then rounding off. When smoothed up and sanded, apply two coats of hot boiled linseed oil and finish with three coats of varnish.

A detail shows the manganese-bronze headstay fitting. The foundry will require a pattern. When making the patterns for this and for the keel, shrink can be disregarded since we aren't working to close tolerances. •

LUMBER LIST

(Approximate Quantities Required)

Specify that all materials are to be used for boatbuilding. All plywood is to be exterior grade. All wood except bending oak is to be dried to a maximum of 15 per cent moisture content. All hardwood is to consist of first, second, and select grades. All softwood is of A and B grades.

Plywood

Decking, Cabin Flooring, and Shelving:
4 panels, 3/8" x 4'-0" x 6'-0"
Transom and Rudder Cheeks: 1 panel, 1/2" x 3'-0" x 6'-0"

Douglas Fir

Harpings: 4 pieces, S2S 3/4", 11 1/2" wide, 12'-0" long
Beams: 3 pieces, S2S 1 1/8", 11 1/2" wide, 6'-0" long
Rudder: 1 piece, S2S 1 1/8", 11 1/2" wide, 8'-0" long
Engine Beds: 1 piece, S2S 1 5/8", 7 1/2" wide, 4'-0" long
Floors: 1 piece, S2S 2 5/8", 3 3/8" wide, 8'-0" long
Keel Pattern: 1 piece, S2S 3 5/8", 9 1/2" wide, 12'-0" long
Wooden Keel: 1 piece, S2S 3 5/8", 11 1/2" wide, 12'-0" long

Bending Oak

Bent Frames: 13 pieces, S4S 3/4" x 1", 12'-0" long
Keelson: 1 piece, S4S 1 1/2" x 5 1/2", 14'-0" long
Outer Stem: 1 piece, S2S 1 5/8", 2 1/2" wide, 8'-0" long

Dry Oak

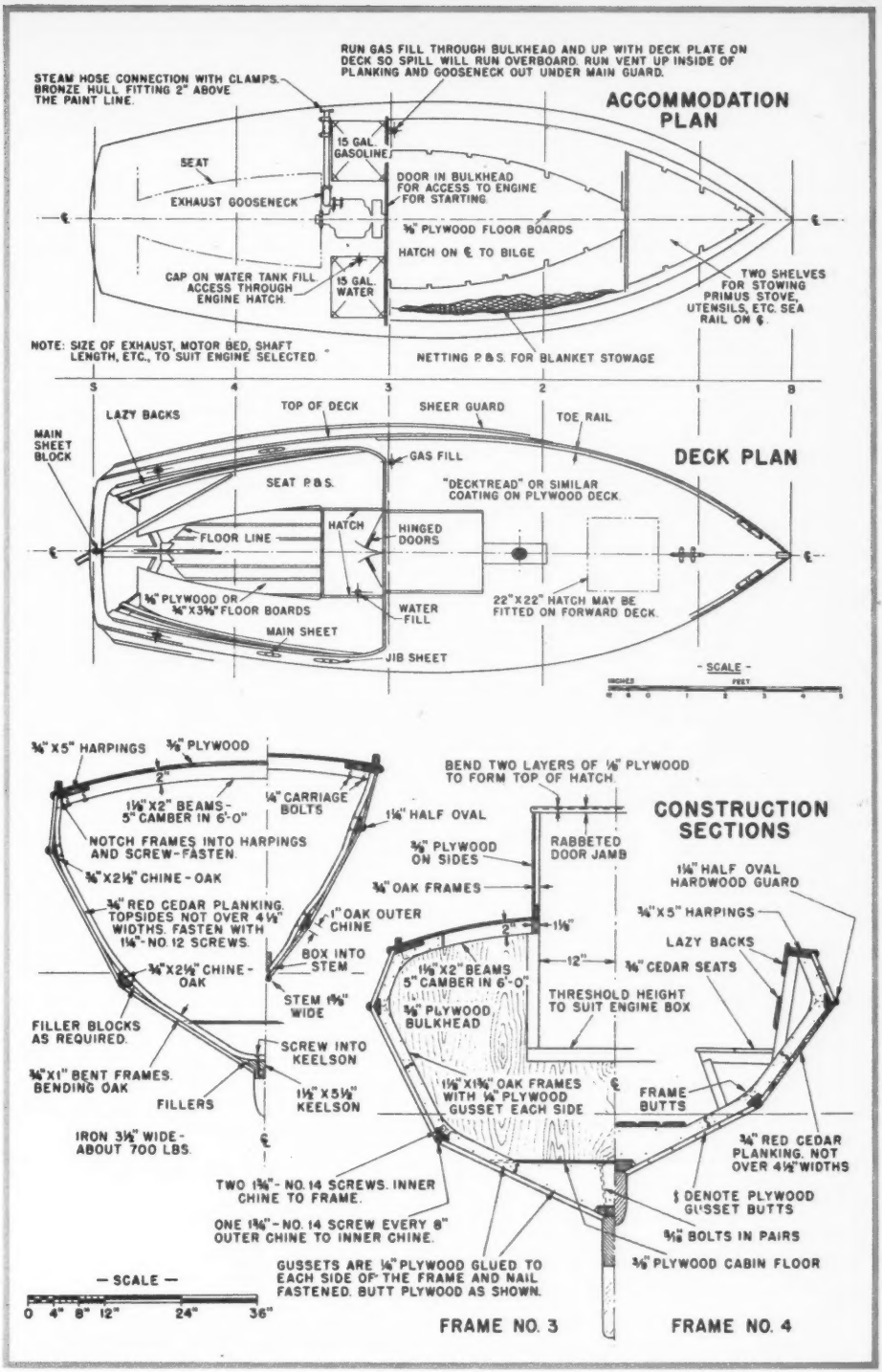
Sawed Frames: 5 pieces, S4S 1 1/8" x 1 3/4", 12'-0" long
Inner Stem: 1 piece, S2S 1 5/8", 7 1/2" wide, 8'-0" long

White Cedar

Planking: 500 lineal ft., S2S 3/4", 5 1/2" wide, random lengths
Cockpit Seats: 1 piece, S2S 3/4", 9 1/2" wide, 14'-0" long
1 piece, S2S 3/4", 11 1/2" wide, 14'-0" long

Sitka Spruce

Spars: 1 piece, 2 5/8" x 2 5/8" x 12'-0" long
1 piece, 3 5/8" x 3 5/8" x 26'-0" long

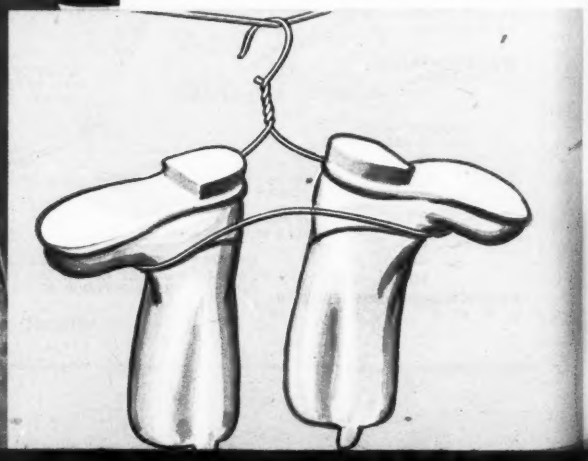

ACCOMMODATION PLAN
RUN GAS FILL THROUGH BULKHEAD AND UP WITH DECK PLATE ON DECK SO SPILL WILL RUN OVERBOARD. RUN VENT UP INSIDE OF PLANKING AND GOOSENECK OUT UNDER MAIN GUARD.
STEAM HOSE CONNECTION WITH CLAMPS. BRONZE HULL FITTING 2" ABOVE THE PAINT LINE.
15 GAL. GASOLINE
SEAT
EXHAUST GOOSENECK
DOOR IN BULKHEAD FOR ACCESS TO ENGINE FOR STARTING.
⅜" PLYWOOD FLOOR BOARDS
HATCH ON ℄ TO BILGE
CAP ON WATER TANK FILL. ACCESS THROUGH ENGINE HATCH.
15 GAL. WATER
TWO SHELVES FOR STOWING PRIMUS STOVE, UTENSILS, ETC. SEA RAIL ON ℄.
NOTE: SIZE OF EXHAUST, MOTOR BED, SHAFT LENGTH, ETC., TO SUIT ENGINE SELECTED.
NETTING P.&S. FOR BLANKET STOWAGE
5
4
3
2
1
B
DECK PLAN
LAZY BACKS
TOP OF DECK
SHEER GUARD
TOE RAIL
MAIN SHEET BLOCK
GAS FILL
SEAT P.&S.
"DECKTREAD" OR SIMILAR COATING ON PLYWOOD DECK.
FLOOR LINE
HATCH
HINGED DOORS
⅜" PLYWOOD OR ¾" X 3⅜" FLOOR BOARDS
WATER FILL
22" X 22" HATCH MAY BE FITTED ON FORWARD DECK.
MAIN SHEET
JIB SHEET
- SCALE -
INCHES
FEET
CONSTRUCTION SECTIONS
¾" X 5" HARPINGS
⅜" PLYWOOD
2"
1⅛" X 2" BEAMS - 5" CAMBER IN 6'-0"
¼" CARRIAGE BOLTS
1¼" HALF OVAL
NOTCH FRAMES INTO HARPINGS AND SCREW-FASTEN.
⅜" X 2½" CHINE - OAK
¾" RED CEDAR PLANKING. TOPSIDES NOT OVER 4½" WIDTHS. FASTEN WITH 1¼"-NO. 12 SCREWS.
1" OAK OUTER CHINE
BOX INTO STEM
¾" X 2½" CHINE - OAK
STEM 1⅝" WIDE
FILLER BLOCKS AS REQUIRED.
SCREW INTO KEELSON
¾" X 1" BENT FRAMES. BENDING OAK
FILLERS
1½" X 5½" KEELSON
IRON 3½" WIDE - ABOUT 700 LBS.
BEND TWO LAYERS OF ⅛" PLYWOOD TO FORM TOP OF HATCH.
⅜" PLYWOOD ON SIDES
RABBETED DOOR JAMB
¾" OAK FRAMES
1¼" HALF OVAL HARDWOOD GUARD
¾" X 5" HARPINGS
2"
1⅛"
12"
LAZY BACKS
⅜" CEDAR SEATS
1⅛" X 2" BEAMS 5" CAMBER IN 6'-0"
⅜" PLYWOOD BULKHEAD
THRESHOLD HEIGHT TO SUIT ENGINE BOX
1⅛" X 1⅜" OAK FRAMES WITH ¼" PLYWOOD GUSSET EACH SIDE
FRAME BUTTS
¾" RED CEDAR PLANKING. NOT OVER 4½" WIDTHS
TWO 1¾"-NO. 14 SCREWS. INNER CHINE TO FRAME.
ONE 1¾"-NO. 14 SCREW EVERY 8" OUTER CHINE TO INNER CHINE.
℄ DENOTE PLYWOOD GUSSET BUTTS
5/16" BOLTS IN PAIRS
⅜" PLYWOOD CABIN FLOOR
GUSSETS ARE ¼" PLYWOOD GLUED TO EACH SIDE OF THE FRAME AND NAIL FASTENED. BUTT PLYWOOD AS SHOWN.
— SCALE —
0 4" 8" 12" 24" 36"
FRAME NO. 3
FRAME NO. 4

Tele-tenna is the answer if you can't erect an aerial for your AM radio. Based on the capacitative coupling principle, the foil disk and the telephone base form two plates of a condenser which transmits radio signals picked up by the exterior phone lines to your radio.

Uniform margins at bottom add to the looks of any typed manuscript. Cut a strip of paper ½ in. wide and roll it around the platen as shown. On a piece of stationary mark off the desired size of your bottom margin, and type the word "Start" on your indicator. Inserting the stationary in the machine, roll platen until indicated margin appears. Run carriage to right, mark "Stop." Platen revolves about three times before page is finished.

Around the House

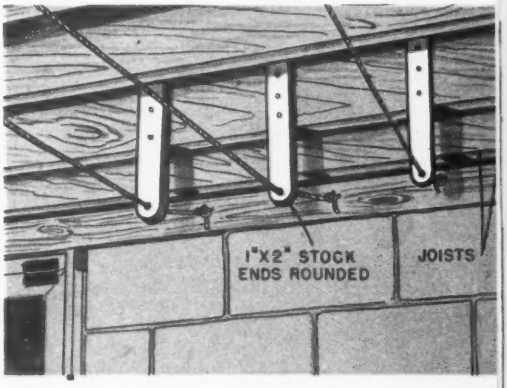
Boot dryer fashioned from an ordinary wire hanger will be a welcome bit of equipment on any hunting trip. It can be hung on a limb near your outdoor fire or from a rafter in a lodge.



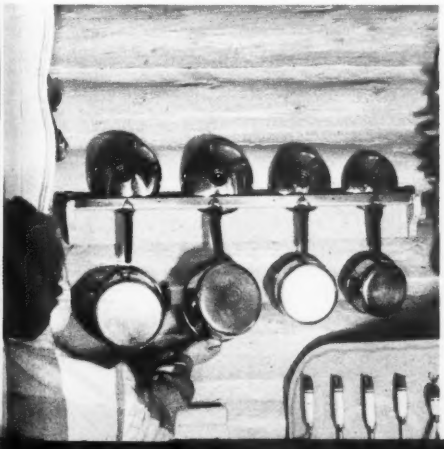
While waiting for Junior to grow into his tricycle, build up the pedals by passing two bolts through pieces of soft pine, then tightening over each pedal. Cement appropriate rubber matting over surfaces.

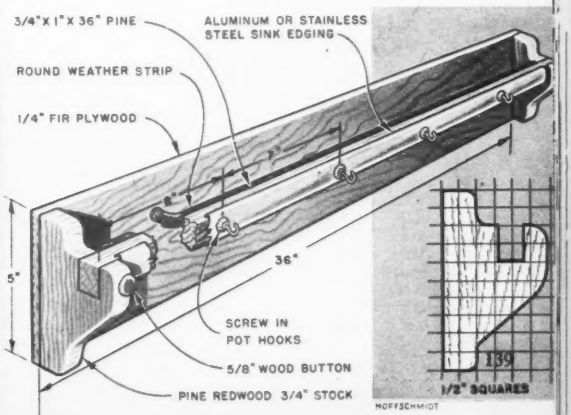
There's no need for the lady of the house to wrestle with stubborn bottle caps. A common kitchen stand-by, the nutcracker, will loosen the most obstinate screw-on type of lid without a struggle.

Clothes line hangers attached to the joists in your basement make a neat and permanent set-up. Cut the cleats from 12 to 18 in. in length, and attach as shown. Bore holes near bottom for threading your rope.



Rugged rack holds four pans and covers. One of the good features is the round weatherstripping along the inside top edge of the rack bar, which prevents lids from scratching. First make the end brackets, then the crosspiece. Add steel trim, hooks, and weatherstripping, assemble, and attach to your kitchen wall.





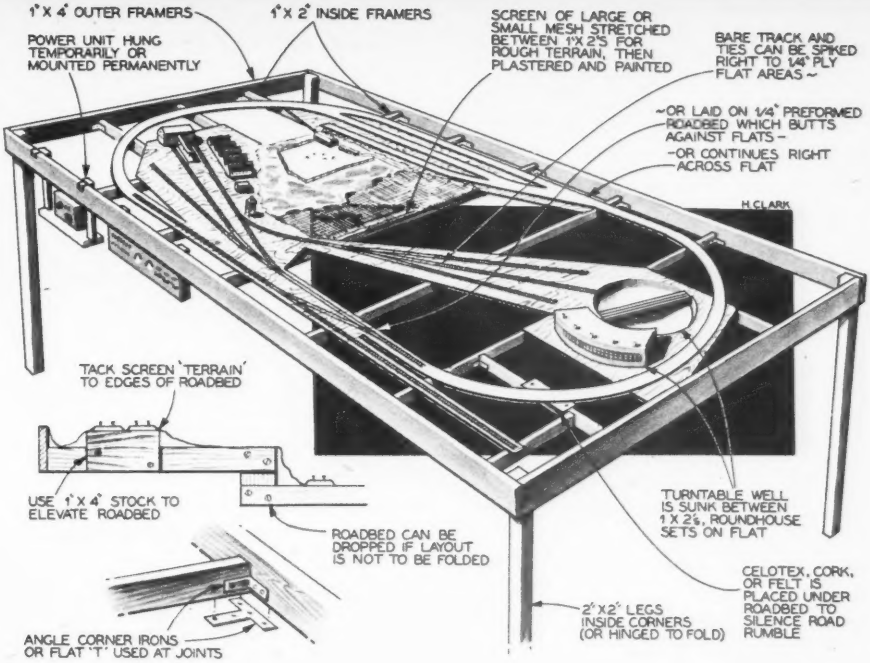
THE MODEL MAKER'S

ROUNDHOUSE

Stowaway Pike

E. V. O'Connell of New York City and his HO pike. It was especially designed for storage as the 2x2 in. legs are hinged for folding.

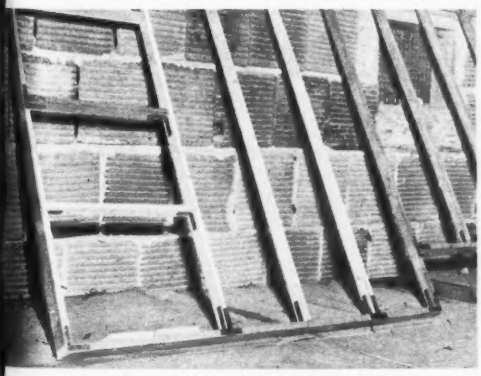
Seven toggle switches control various sections of track. Speed control knob is at lower left. Arrow points to the readily accessible fuse.



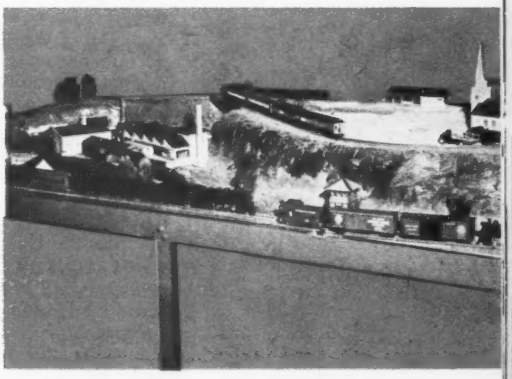
TODAY'S model railroader who dreams of his or her own layout is faced with a big problem—space. Unless you have an extra room to spare or a large basement, you'll find yourself confined to the ranks of an armchair engineer. Lack of space need not keep you from building and operating a well-rounded HO layout, even in the smallest of city apartment. A few feet of lumber, simple tools, an understanding wife and we're on our way to the solution of the pike problem. The answer is the portable layout.

The most popular layout sizes in portable pikes range from 4x6-ft. through 6x8-ft., anything larger becomes a problem in both moving and storage. We will deal here with the most popular size, 4x8-ft.

The frame for our portable layout is composed of 1x4-in. stock for the perimeter and 1x2-in. for the cross members. Three 8 ft. lengths of [*Continued on page* 164]

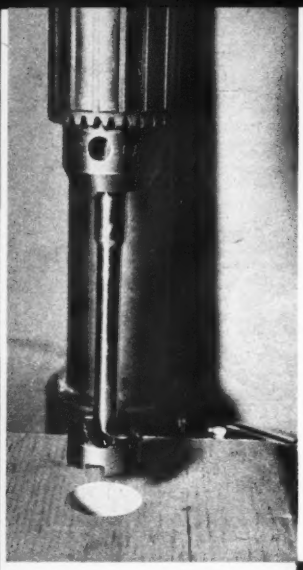


The framework of the pike showing the generous use of angle irons and tees to reinforce the joints. Outer parts are 1x4 in. stock; inner, 1x2 in.

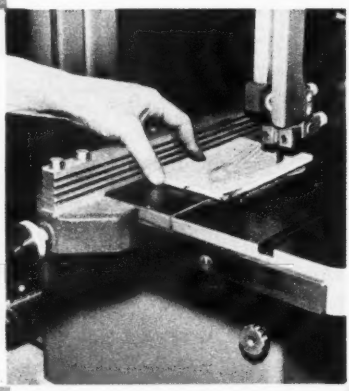


Because of its two-level construction, the realism in the pike is very good. Heavy brown wrapping paper was used as a background for the landscape.

NEW for the SHOP



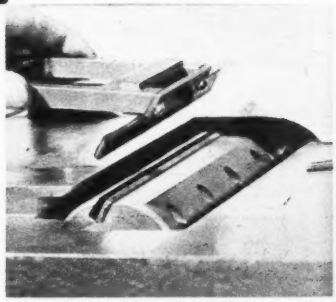
PTI bit, for cutting holes in wood, is made in sizes from 5/8 to 2 in. by $\frac{1}{16}$ths. Work can be drilled without pilot hole or centering. Bit can be detached from shank for sharpening. PTI, Inc., N.Y.C.



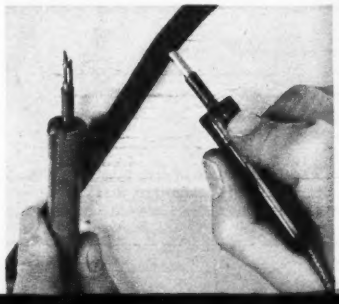
Automatic wire stripper, below, accepts wire from 8 to 22 gauge. Delayed action prevents wire from being crushed as handles are released. By Specialty Mfg. Co., Rockford, Ill.

Rip fence can be attached to any model band saw by means of ¼x1 in. steel bar fastened to front of table. As knob is tightened, fence is forced in contact against face of table. Made by Shopmaster, Inc., of Minneapolis.

Jointer knife setting gauge, made by McCormick Tool Co. of Winslow, Ariz.; permits accurate locking of jointer knives without disturbing uniform setting as setscrews are tightened.



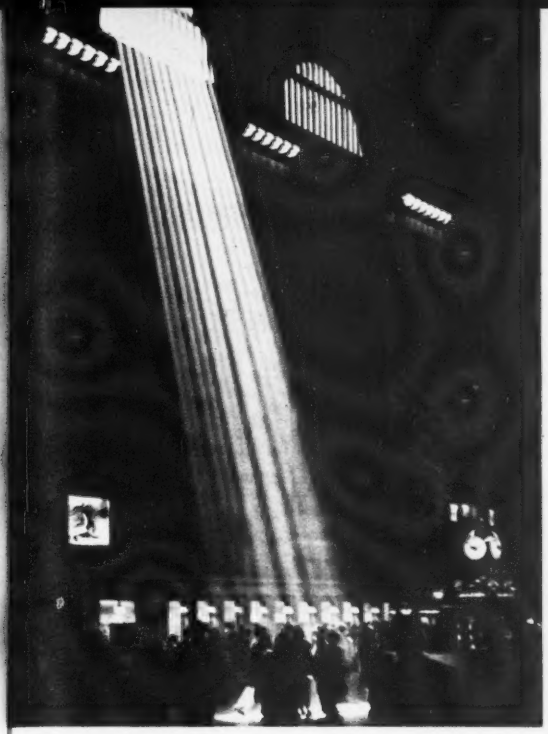
Self-holding test prods, called Klipzon, are made by United Technical Labs of Morristown, N. J., allow operator free use of both hands. Needle sharp prods have spring-loaded barbs near tips for gripping.



MONTHLY

photo contest

Please put your name, address and picture-taking data on back of each print. Wrap with cardboard stiffeners and enclose a self-addressed stamped envelope or postage for return of unused photos. Prize-winning pictures are not returned. Judges are MI Editors. Duplicate prizes awarded in case of tie. Please address your entries to: Photo Contest, *Mechanix Illustrated*, 67 W. 44th St., N.Y.C. 18



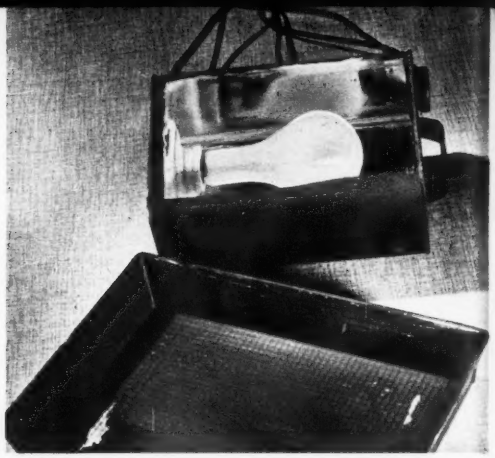
First Prize ($10.00) .....Ten To Three
Joseph Morschauser of Poughkeepsie, N. Y., took this shot with a Leica on Super XX film; exposed at 1/10th and f-3.5.

$5.00 Award .....Sunset Bathers
Taken by Frank Meitz of Los Angeles with an Argoflex; 1/100th and f-16 on Plus X film; developed in Microdol.

$5.00 Award .....Big Cat
A Busch Pressman was used by Joel Katz of New York City, for this photo; 1/50th at f-4.5.

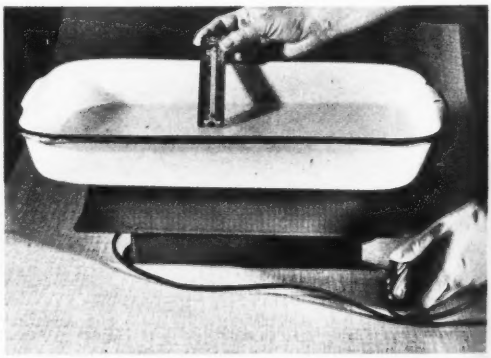
$5.00 Award .....Bedtime For Susan
Bobby Coke of New Orleans, used a 5x7 Watson view camera with a spot and a flood for light.

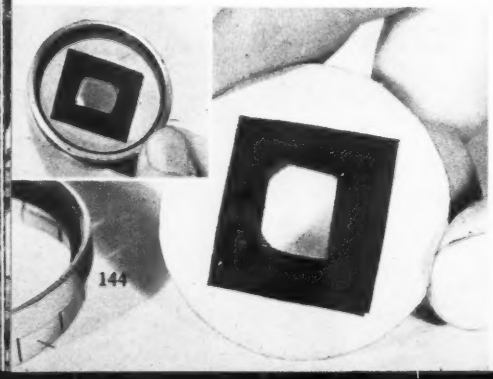
darkroom kinks



Solution warmer is an easy-to-make unit consisting of a cake tin, oil can and less than a dollar's worth of electrical supplies. An ordinary can opener and a screwdriver are the only tools necessary. The can opener is used to open one side of the oil can, as illustrated. It can also be used to make the holes in the bottom of the can for the bolts which hold the porcelain socket. A 100-watt bulb will bring the solutions to their correct temperatures in a very short time. The cake tin prevents the solutions from spilling over the socket.

Film washing in a developing tank can be accomplished easily in any sink even when the faucet's position will not allow the water to flow into the center of the tank. Push a piece of rubber tubing into the faucet and into the center of the tank. This allows the water to flow up from the bottom, washing the film.



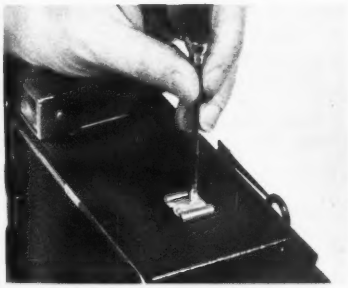


Spectacle lenses can be used when extra magnification is desired for close-up work. The mount is made by cutting a cardboard disk to fit an adapter ring and taping the lens over a hole cut in the center of the disk. Several can be used for extra magnification by fitting the rings together.

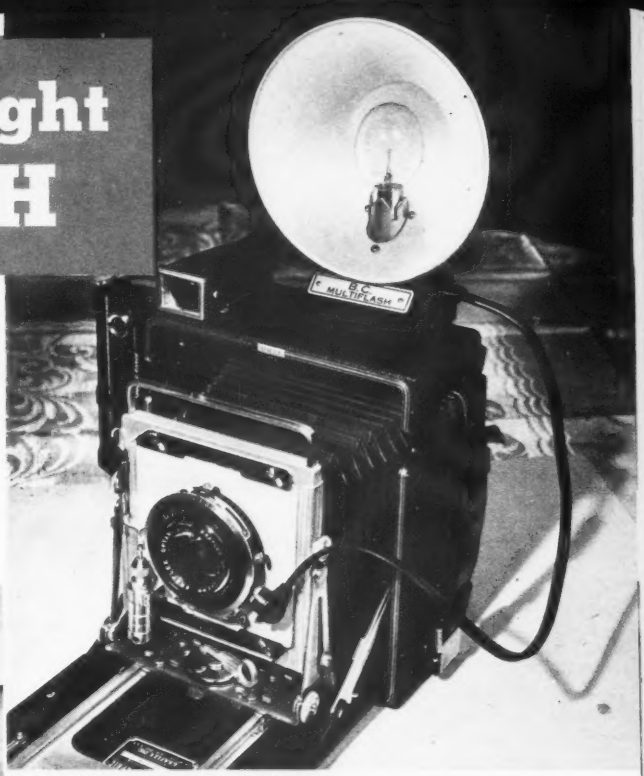
lightweight FLASH

The new BC (battery-capacitor) flash guns, because of their extreme light weight lend themselves admirably for use with heavy press cameras. Photo below shows how the sled is detached from a Leica mounting bracket supplied with the Kalart gun and mounted directly to the battery case. This brings the unit closer to the camera body. Sled can be bolted from inside or soldered; leave room for shoe.

Below: Next step is to mount a Leica accessory shoe on top of the camera.



How the revamped flash gun is inserted into the top of the camera.



Finished and ready to flash. The cord originally supplied with the Kalart gun can be used or you can use a Graflex S-17. Reverse usual position of cord so that solenoid tips fit battery case. The right-angle battery side of the cord fits the phone tips of the Graphex shutter.

WIDE-ANGLE

How would you like to be able to take photographs like the one above without using a wide-angle lens?

By Charles Burgie

PHOTOGRAPHS with as much of an angle as 180° are no problem and do not require the use of expensive wide-angle lenses when this easy-to-build unit is used.

To take wide-angle photos that will line up properly, the swivel point of the camera must be at the center of the lens.

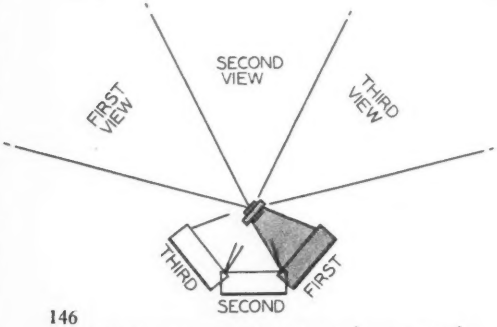
To accomplish this, cut an oblong piece of metal or wood 7x3 in. Tap a hole for your tripod screw at one end and cut a slot approximately 2¾x¼ in. at the other. A ¼-in. stove bolt or thumb screw can be used for this hole.

File the screw's shank near the head to permit it to slide back and forth along the slot. This permits you to adjust the position of your camera so the lens will be directly over the front screw, allowing it to pivot at that point.

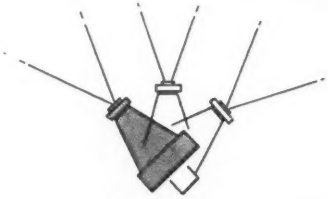
When taking wide-angle photographs, it is wise to note certain landmarks at the edges of each view before moving your camera for the next exposure. This is done to allow for a bit of overlap which is necessary to avoid missing part of the scene. The landmark should appear on each adjoining print before the prints are trimmed flush to a perfect fit.

All photos should be exposed, developed and printed exactly alike. •

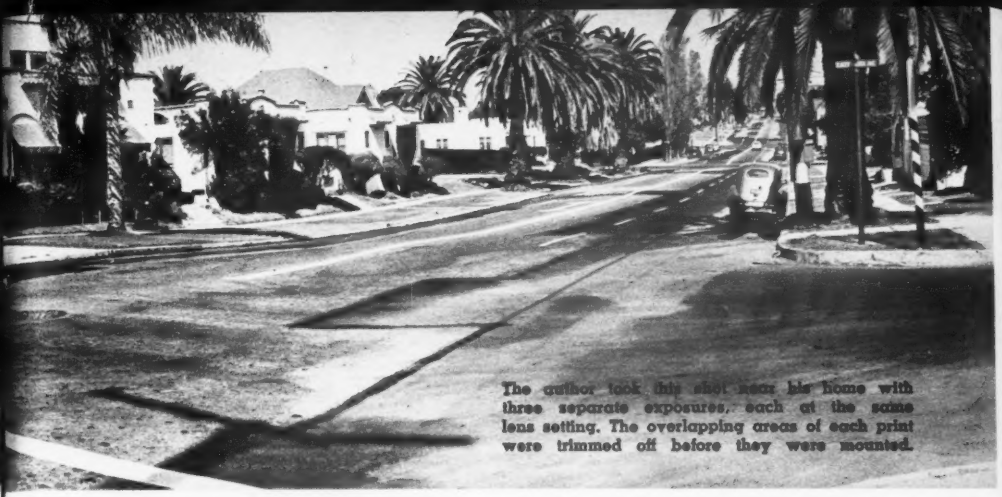
Diagrams to the left and below, show the right and wrong ways wide-angle photographs are taken. Slight overlap should be allowed to make sure no part of the photo is left out in trimming.



CAMERA MUST PIVOT ON IT'S 'LENS AXIS'

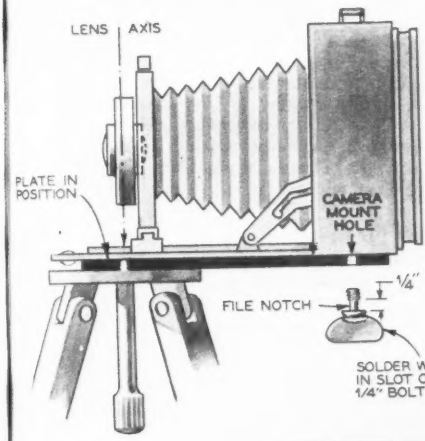


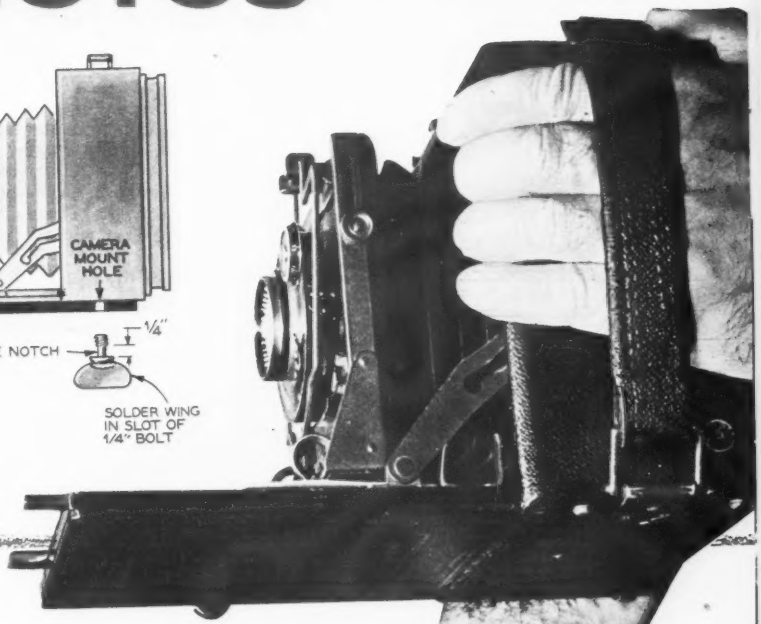
NOT ON IT'S BED AS IS COMMONLY DONE

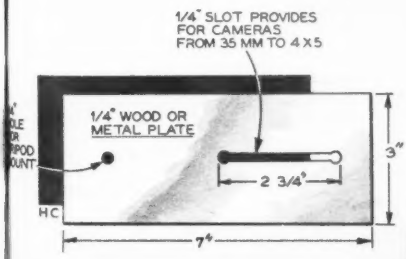


The author took this shot near his home with three separate exposures, each at the same lens setting. The overlapping areas of each print were trimmed off before they were mounted.

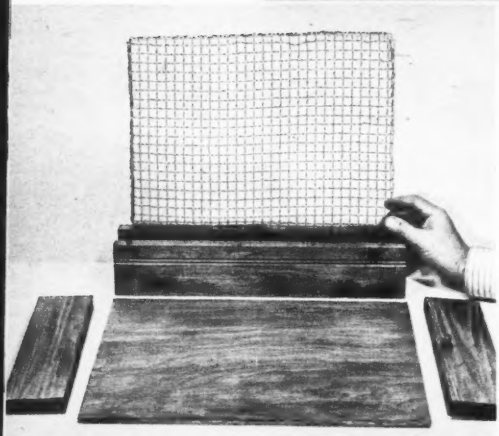
PHOTOS







Print Washer



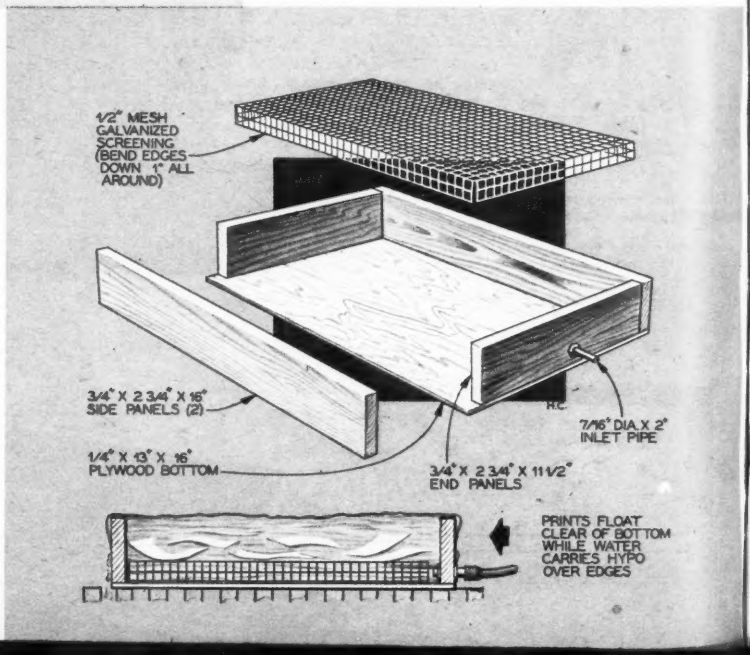
Assure yourself of hypo-free prints with this inexpensive print washer.

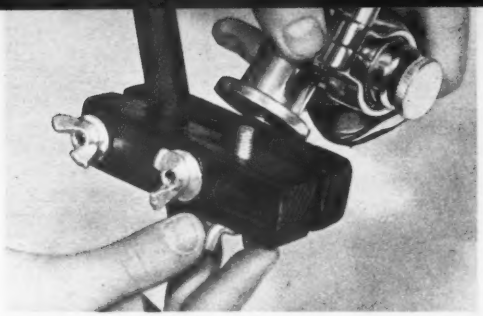
By Robert Hertzberg

THE usual tendency of prints to stick to the bottom of a washing tray is overcome by this washer. A false bottom is its secret. This false bottom consists of a piece of galvanized screening which is mounted inside the washer which is made of scrap wood. The water outlet consists of a 2-in. piece of threaded brass pipe, $\frac{7}{16}$ in. diameter, with a hex nut on each side. These are electrical fittings which cost very little.

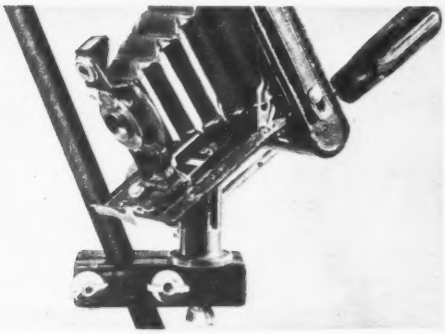
If you work with extra large prints, adjust dimensions accordingly. Finish off wood with two coats of varnish. •

The four sides are made of scrap wood and are assembled with butt joints.





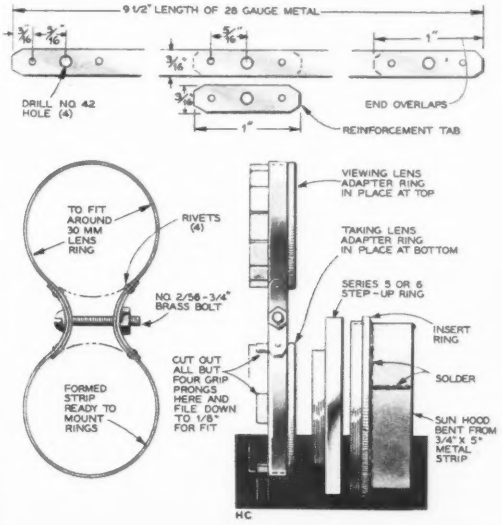
Low Tripod Attachment

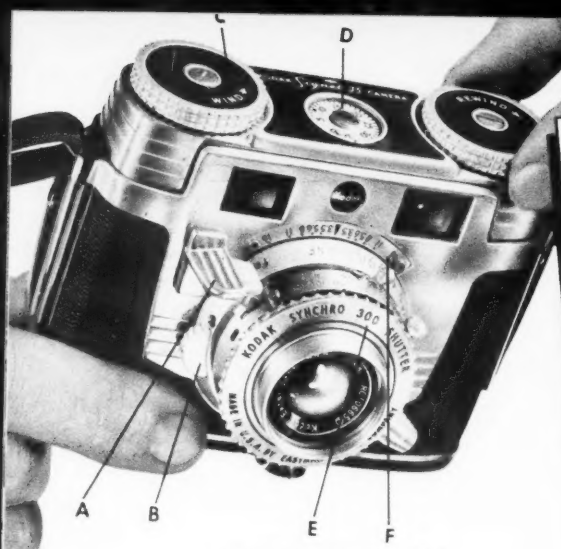


This is the unit to build if you want to shoot objects that are too low for your tripod. It consists of two pieces of wood, 4x1x¾ in. and three carriage bolts with wing nuts placed as shown. Holes are drilled in the wood to accept the bolts and grooves are cut to fit your tripod. The grooves should be cut at an angle so they keep the camera level. •

Dual Adapter Rings

THE dual close-up adapter unit shown here will solve the close-up problem for the new Rolleiflex f-2.8 camera. All of the parts of the attachment are of American manufacture and easily obtained at all photo supply stores. The assembly of the unit requires [*Continued on page* 152]



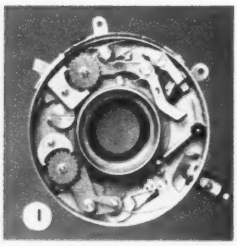


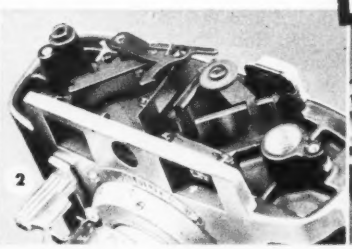
Kodak's newest color miniature with world-famous EKTAR LENS

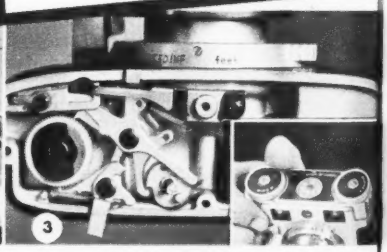
Here's a gem of a range-finder "miniature" that boasts a Kodak Ektar Lens (f/3.5 Lumenized)—famed as the finest in countless photographic fields—unsurpassed for producing sharp, brilliant color slides for projection or full-color prints. Be sure to see the Kodak Signet Camera at your dealer's—only $92.50.

EASY-TO-USE CONTROLS

- **A** Feather-touch shutter release bar
- **B** Finger-tip control for superimposed-image range finder
- **C** Winding knob has interlocks for double-exposure prevention and film stop
- **D** Easy-to-read exposure counter
- **E** Shutter with speeds up to 1/300, built-in "flash"
- **F** All lens-and-shutter settings visible from above







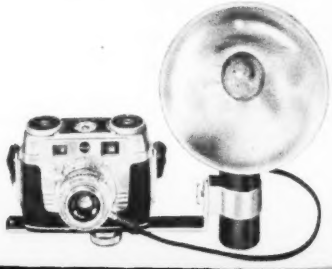
1. Shutter mechanism is sturdily built for lasting reliability. Accurate flash timing for the popular No. 5 and 25 lamps at all speeds—1/25 to 1/300. "B" setting for time exposures. Sturdy, 2-blade design is exceptionally efficient.

2. Superimposed-image range-finder mechanism is rugged, with all parts generously dimensioned. Spring-loaded, V-block bearings eliminate the small bearing variations that cause serious range-finder errors. Range finder is combined with view finder for rapid focusing and framing through a single window.

3. Film-advance mechanism is smooth and jam-proof. Film can be advanced with a flick of the thumb (see inset). Exposure count and double-exposure prevention are automatic, but deliberate double exposures can be made at the touch of a lever.

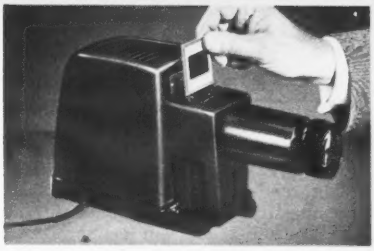
For protection and convenience—Handsome, tan leather field case with neck strap. $8.50.

For brilliant indoor shots—the Kodak Flasholder, Model B, is quickly attached for synchronized flash pictures. $10.55.



The "payoff" in color photography is a BRILLIANT SHOW

On your screen . . . on your viewer . . . it's the show that counts. 2x2-inch slides of travels, home scenes, lecture subjects sparkle with new brilliance in living room or auditorium when shown with the right equipment. On this page you'll find a selection from which to choose. Ask your Kodak dealer for a demonstration. He'll be glad to help you.



Kodaslide Merit Projector—Features improved slide-feeding mechanism—you feed slides in *top* of projector, minimizing jarring of instrument. Includes Kodak Projection Ektanon Lens, 5-inch f/3.5. $26.10.

Kodaslide Projector, Model 2A—Ideal for small shows. Heat-absorbing glass protects slides. Powerful lamp projects images up to 7 feet wide. With Kodak Projection Ektanon Lens, 5-inch f/3.5, $52.80.

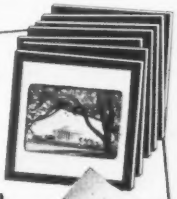
Kodaslide Projector, Master Model—For large-group showings. Fast lenses and 1000-watt lamp can deliver more light to screen than any other 2x2-inch slide projector. Turbine-type fan cools both sides of slide. Choice of four projection lenses. From $169.

Kodaslide Table Viewer, Model A—Projector, screen, and slide changer in a single unit. Projects brilliant images even in a lighted room. Takes 75 cardboard or 30 glass slides. $97.50.

Kodaslide Table Viewer, 4X—This new low-priced viewer enlarges slides more than four times on its built-in screen. Ideal for effortless showings to small groups. $49.50.

FOR A SURPRISE SHOW—

Treat your audience to professionally prepared color slides, too. Many interesting subjects at nominal cost. Ask your Kodak dealer.



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Car Care

[*Continued from page* 130]

to vary the proportions of air automatically to meet different conditions under which the engine is forced to operate. That explains the need for an idling jet, the high speed system, the acceleration pump, an economizer and the choke.

In the early days of motoring gasoline was high test. That is, it was very volatile, and carburetion was simpler as a consequence. This will surprise readers who incorrectly ask for high test gas when they want premium gas. The extra-price fuel is higher than the regular only in anti-knock quality. It has a higher octane rating, but isn't high test in the original sense or as fuel men know it. That modern gas isn't extremely volatile is demonstrated by its slow evaporation. When Joe spills some on the left rear fender, it stays there for a long time before it evaporates. Naturally with gasoline that reluctant to go into vapor we need preheating by means of an automatic manifold valve, hot spots, special intake manifold design, not to mention the choke system which serves as a substitute for normal action when there is no heat and the motor is being started cold.

Nature is said to abhor a vacuum, so we may be justified in skipping over the technicalities of carburetion and concentrate our fire on the mechanical features of the car's most taboo unit. Some of it is reasonably simple, yet every function is important in terms of what you can get from the car by way of performance and efficiency. The float bowl is typical. Here we have a supply bowl fed by a small pipe leading from the fuel pump. Inside is a hollow float which, rising on the fuel, closes the needle valve at the desired top. This checks further flow of fuel from the pump. If this float reaches too high a level, too much fuel reaches the jets and the engine labors with a too rich mixture, regardless of other adjustments. A lean mixture results from a low float level. This float is hinged. Changing the float level usually is accomplished by bending the arm of the float.

If it binds against the wall of the bowl the float can cause a lot of trouble especially on carburetors where the clearance is small. Many carburetors have dual floats and throttles, and as such are really dual carburetors. These are not to be confused with the compound carburetion system used on the 1941 Buick. This was an arrangement whereby the engine was fed with two dual carburetors. Object of the usual dual carburetor is merely to provide each half of the motor with its own fuel supply.

On some carburetors there is a sight plug

[*Continued on page* 160]

Dual Adapter Rings

[*Continued from page* 149]

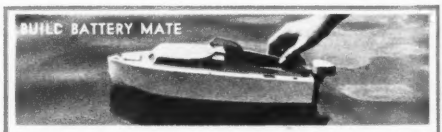
a minimum of critical workmanship and tools.

To assemble the dual adapters into a single unit, first rivet together the retainer strap ends and attach the reenforcement tab on the opposite side of the strap. Some work will be required upon the adapter rings inasmuch as the viewing lens mount and the taking lens mount are not identical in design. The only adjustment however upon the viewing lens adapter will be to bend the clamp prongs in or out for a snug fit against the inner rim of the lens barrel.

The taking lens adapter ring will receive more alteration. Cut away all but four of the clamp prongs leaving one prong at each of the four points of the compass. Cut $\frac{1}{16}$ in. from each of the remaining prongs leaving but ⅛ in. Now test by inserting the adapter inside the taking lens barrel, continuing to grind the prongs down until the shoulder of the adapter ring lies flush on the lens rim and with all four of the prongs resting firmly upon the screw seat inside the lens mount rim. Adjust the prongs by bending for a press fit. To assure that both adapters are exactly parallel to each other, lay them face downward upon a level surface without the insert rings. Lay the completed retainer strap over the pair of adapters and insert the brass bolt over the pair of adapters, drawing the nut up lightly. With the adapters still on the flat surface proceed to solder the retainer strap and rings together.

By drawing the central bolt and nut tighter the two adapter rings are forced closer together, until they fit firmly inside the rims of both viewing and taking lenses.

The sun hood makes a very helpful addition to the dual adapter unit and requires but one operation. Purchase a Series V to Series VI step-up ring, with insert ring attached, at any photo supply store. Remove the insert ring and file or grind out the small retaining shoulder on the inner surface. Shape it to the bottom of the ring and solder it fast. The step-up ring is screwed into the Series V adapter on the taking lens with the sun hood in place. •



Using a battery-powered outboard motor, this handsome model really performs beautifully. Construction is mostly of balsa, with plywood added where extra strength is required. For your copy of these complete, full size plans, remit 50 cents to MECHANIX ILLUSTRATED Plans Service, Fawcett Bldg., Greenwich, Conn. Please specify Plan No. 420.

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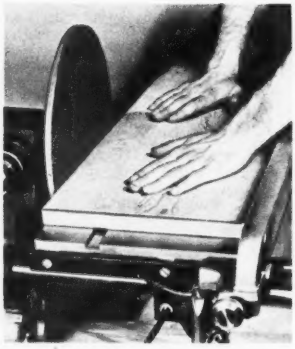
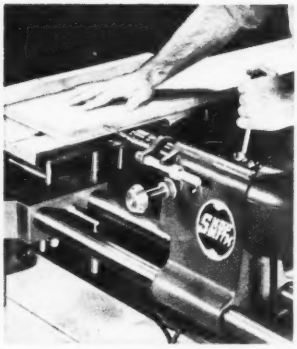
1 "***Big-job capacity.*** I don't know of any other 8-inch saw that matches the capacity of SHOPSMITH. The table extension gives you a working area 17" x 54". Sawing long boards and 4' x 8' plywood panels is a *one*-man job."



2 "***Smoothing edges*** with the disc sander is a SHOPSMITH exclusive. It's done by setting the rip fence at a slight angle to the disc. Work fed between fence and disc is jointed to precise widths. The big, tilting table gives plenty of support."



3 "***Perfect doweling*** is possible with SHOPSMITH in the horizontal drill press position. Work is laid flat on the table and backed up by the rip fence. Drill is fed in from the side. Ball and crank table-raiser accurately adjusts table height."

See SHOPSMITH demonstrated at leading hardware and department stores or any Montgomery Ward store. FREE! 16-page information-packed catalog. Gives details and specifications on SHOPSMITH and accessories. Write for it.

Basic SHOPSMITH includes all attachments for . . .
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5-tool unit complete except for motor* $189.50

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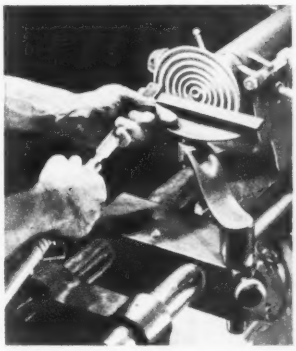
ON SHOPSMITH!"

"A built-in wardrobe cabinet was my first real SHOPSMITH project. And what an eye-opener it was! I never realized that SHOPSMITH could do so much in so many different ways in such limited space.

"I like the way SHOPSMITH converts quickly and easily from saw to disc sander to wood lathe to horizontal and vertical drill press. I like the way it's made—four ball bearings, heavy castings, precision-fitted parts. Best of all, I like its flexibility and the fact that, in each of its five positions, it has features you won't find in any other power tools. Simplified micro-adjustments and convenient, ready-to-use jigs, for example.

"In making the cabinet, I found that no job was too big, too difficult, or too unusual for my SHOPSMITH. Being able to use the right tool the right way saved me hours of time. And the accuracy I got was mighty satisfying. It was a big job, but SHOPSMITH made it easy!"



4 ***"Face to face.*** SHOPSMITH is the only lathe that lets you face your work while turning knobs, bowls or other flat or hollow objects. The full-swivel tool rest makes it easy to get into and behind faceplate turnings. Lathe has 15" swing, 33" capacity."

5 ***"Tall trimming.*** I needed to trim 3" off the side of the doors for the wardrobe. So I set SHOPSMITH in the vertical saw position and used the floor as a fence guide. It was a lot faster than hand sawing—and far more accurate."

6 ***"Built-in jig.*** When it came to drilling dowels for the drawer pulls, SHOPSMITH again showed its flexibility. The fence and tilting table formed a V-block for holding the dowel accurately. SHOPSMITH as a drill press is second to none!"

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Care and Feeding of Engines

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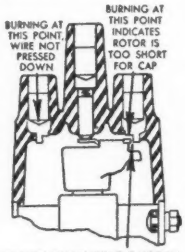
COLD-WEATHER STARTING

One cause of hard starting in cold weather can be ignition trouble. One cause of ignition trouble can be high resistance in the heavy wire to each spark plug, or from coil tower to distributor cap. A leak or dirty connection can cause a lot of trouble. *First: Stop engine.* Grasp each wire near top of distributor cap and try to force it down. You may feel it slide into place. Out of place, it could have caused hard starting. *Next:* Pull out one wire at a time and see that clip is clean. Look into wire tower with a flashlight; if dirty, clean with abrasive paper on end of a pencil. Replace wire, making sure it is down in the cap. Do this with each wire, even the coil wire. Clean top of distributor with carbon-tetrachloride.



STOP-LIGHT SWITCH

Your stop-light switch can run your battery down. This small hydraulic switch on the brake line is closed by pressure when brakes are applied. Dirt and dust with oil vapor will at times cause a current flow when switch is open. Make sure connections are clean and tight.

When replacing this switch, have the new one ready to install at once, in order to avoid losing brake fluid. Have someone depress brake pedal slightly, to fill fitting as old switch is removed. Install new switch quickly and tightly. Then replace wires. If brakes are then spongy, bleed air from brake line.

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Early American Desk

[*Continued from page* 112]

pleting the slant front. Align and set hinges.

Now let's tackle the drawers. The drawers were doweled at the corners rather than dovetailed. The drawer fronts are rabbeted and shaped after cutting. Rabbet all four sides and check the main frame for accuracy. Cut all sides and backs and dado for the bottoms all at once. Alter set-up for the fronts of course, to allow for the shaped edge. Now clamp sides and fronts and drill for four ¼-in. dowels. Glue and drive, trim off ends and you have a fine joint.

Cut center runners if needed and apply to the plywood bottoms. Match runners on the center board of the basic frames to insure easy removal and insertion of the drawers.

Cut the base section and miter the front corners at 45°. In addition, dowel the front base to the sides.

After jig sawing the base parts, align on the frame so that you have room for the ¾-in. cove molding on top edges. Drill the base panels and screw from the inside to the base sections on the sides. Apply a 1-in. strip across the front, screwing to the basic frame and then screw through this to the front base piece. Glue and screw, then dowel the mitered corners and corner block. Place two blocks in the back for support on the back ends of the base sides. Now apply the ¾-in. cove molding and miter for a perfect fit at the front corners. Thus, the basic shell, the drawers, and base are completed.

This interior will go very rapidly and it is lots of fun making the little drawers. The interior nest of drawers and pigeonholes are principally a matter of fitting carefully. Measure closely and dado where convenient. The outside measurements should be ⅛ in. smaller all around so that sufficient clearance results.

Dado the top panel. Build up from the bottom, dadoing and cutting the partitions as you go. Use 1-in. finishing nails and glue. Then insert the partition scrollwork and tack from the top. The door stiles should have ¾ in. rabbets for the door stop.

Cut the drawer front, checking for a close fit and altering if necessary. Rabbet the fronts and dado the pieces for the bottoms. Assemble with nails and glue. Install stops at the back so they all fit flush, then tack on the backs.

At this point, attach hinges and insert the locks. Bore holes for the drawer pull bolts, but do not attach them yet, as they will interfere with the finishing operation.

You may finish the desk in several ways. The easiest is waxing. Merely apply up to six coats of furniture wax, buffing vigorously after each coat. A shellac finish is also not difficult to apply and wears well. •

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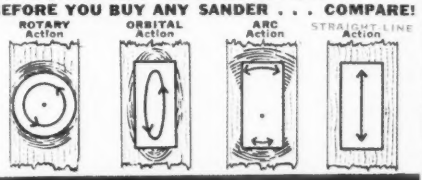

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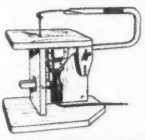

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DREMEL MFG. CO. Dept. 142-B Racine, Wis.

Build The PBY Catalina

[*Continued from page* 120]

roughly to shape from soft balsa and cement to the bow. When dry, complete the carving and sand smooth. We found it necessary to add about one ounce of weight to the nose to make the model balance properly. Now is the time to add this weight to the inside of the nose block before it is cemented in place. Be sure to round off the corners of the hull in way of the ¼-in.-square fairing strips, as this is their prime function. Add the upper portion of the fin and carve and install the rudder. Be sure to offset it as the plans indicate. Cut and fit the bow fairing block now. However, do not cement in place at this stage.

The pylon wing mount is carved from medium balsa. Sand smooth and cement securely to the fuselage-hull top. It is suggested that a light coat of cement be applied to each part before assembly and, when dry, a second coat be applied before the pylon is added. Fillet the pylon joint with several coats of cement or commercial fillet compound. Sand well.

When building the wing, it is advisable to start with the leading edge. This is cut from medium-soft balsa. First cut it to proper length and then cut the leading edge taper in top view. When complete, the front view taper is cut. Trace all ribs on $\frac{3}{32}$-in. medium balsa and cut and sand to shape. In view of the exceptional rigidity of the leading edge and because of the wing taper, we built the wing without pinning it over the plan as in the more conventional procedure. Instead, we marked off the rib locations onto the leading edge and cemented the ribs to it, holding them in place with pins until dry. Cut the trailing edge to shape, or preferably use a pre-formed trailing edge, and cement to the ribs in a similar manner as the leading edge. Sand the structure and recement all joints.

Now a decision must be made! Will you fly from land only, water only or from both, as we did? Your decision will govern the size of your engine. The position and size of the wing tip float is also governed by your decision. See sketch. Here is the procedure for amphibian construction:

Fuel tanks should be fabricated at this time. We installed ours in the wing and this required a very shallow tank. Be sure to make the fuel feed line of ample length to reach the engine intake without kinks.

The wing is covered with light silkspan using thick dope or slow-drying cement as the adhesive. Be sure also to allow the fuel vent and refill lines to protrude through the covering. Water the covering and, when dry and tight, apply four coats of clear dope.

If a beam-mounted .09 engine is used, install the hardwood mounts to the wing securely. If a radially mounted engine is used, carve the engine nacelles, cement in place and then install the plywood bulkhead mount. The engines can be mounted upright, inverted or pancake fashion. We were fortunate to obtain metal cowls that fit our model quite well. These are manufactured by and are available from the Scientific Model Airplane Co., of Newark, N. J., for only twenty-five cents each plus postage, or at your hobby shop. These cowls can be held in place with small straight pins. Cowls can be turned on a lathe from pine or balsa if desired.

The wing is now cemented to the pylon. However, a small section of tissue should be removed from the underside of the wing just about ¼-in. on each side of the center rib. This will insure good wood-to-wood contact in this cement joint. Use liberal quantities of cement in this operation. The pine wing struts are added at this time. These are structural items and should be imbedded into the hull. They should also pierce the wing covering and be cemented to the wing rib as well as to the covering. Fair these joints with cement.

The wing tip floats should not be made any smaller than shown. These are cut from soft balsa blocks. The main strut is forced into the float and is well cemented, while the upper portion is slipped between ribs No. 8 and is rigidly cemented.

Bend the landing gear struts to shape and bind the main landing gear joints with fine soft wire (milk bottle cap wire) and solder well. The nose wheel strut is bent to shape and then soldered to the sheet brass or tin can metal. Now fit these assemblies to the model marking off the holes for the screws. It is suggested that small pilot holes be drilled (approx. 3/64-in. in diameter) to guide the screws and prevent them from splitting the foundations. After the struts are fitted, they are removed. The model is now ready for painting.

All exposed wood surfaces should be given at least four coats of wood filler (Testor's Sanding Sealer). Sand well between coats. Using Testor's dope we applied five thin coats of silver to the hull, the undersurface of the wing, nacelles and empennage, or tail assembly. When thoroughly dry, mask off the hull bottom and paint it dark green or, if desired, the hull bottom can be covered with green Trim Film as on the prototype model.

[*Continued on page* 164]

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[*Continued from page* 152]

in the side of each bowl which, when removed, enables you to see just where the level is. A too high level, or a tendency for the bowl to flood, is an indication that the needle valve or its seat needs replacing, assuming that the float has been properly adjusted. This valve is found in that part of the bowl where the fuel line is connected. It may be in the side of the bowl or the top. Sometimes an over-energetic fuel pump will unseat the valve. In that event pump pressure must be reduced by decreasing the length of the pump's stroke. An air dome on the pump often helps to control pressure. Incidentally, just ahead of the needle valve is a little strainer which should be carefully cleaned occasionally. It may clog from foreign particles which get by the fuel line filter and may cause hard starting.

Up until the early 30's the carburetor was so located that fuel vapor was sucked up into the intake manifold and thence into the cylinders. No one had been paying much attention to the fact that gas vapors, unlike other kinds of gases, fall rather than rise. The industry then developed downdraft carburetion and up went the carburetor to a new seat of honor atop the motor. Here, however, it was subjected to new problems. Under the present arrangement the carburetor is exposed to more heat, increasing the chances of vapor lock. Here jet leakage can cause loss of raw fuel into the intake manifold to cause excessive gumming there and a drop in volumetric efficiency. This weird term merely refers to the quantity of gas drawn into the cylinders.

Another disadvantage in the relocation of the carburetor came into the picture when the air cleaner arrived. This heavy unit mounts atop the carburetor air intake and acts like an upside-down pendulum when the modern flexibly mounted engine shakes during its critical vibration points. Because the cleaner comes loose there's a temptation to overtighten the wing nut thereby cramping the air intake of the carburetor. Since the choke valve is in this part of the carburetor you can appreciate how easily it may be disturbed. This well illustrates the importance of going easy whenever working on or around the carburetor. Easy surely does it.

Just a word here about the venturi. This really is the mixing department where gasoline comes out of the high speed jet and is caught by air coming up around the nozzle. Due to the venturi principle causing a pressure drop at the jet and an increase in air pressure a higher percentage of fuel is vaporized. Your modern carburetor doesn't reveal any hour glass appearance of the chamber because several venturi are used, two or three air streams working on the one fuel spray. This results in greater protection against possibility of the gasoline contacting the walls of the mixing chamber and condensing there. Varnish, a particularly tough form of gummy deposit, may collect in the venturi to cause sluggishness in spite of these precautions.

The idling jet is located below the throttle so that it can operate when the valve is in its most restricted (never fully closed) position. This jet is adjustable. You see the adjusting screw on the side of the carburetor just above where it bolts to the intake manifold. Usually turning an idling screw in (clockwise) leans the mixture, whereas turning it out (counterclockwise) enriches it. The engine should be normally hot during such adjusting, and should also be accelerated frequently to prevent overloading. Use a short screwdriver for turning these jets. In this way you can more easily tell how many half turns you have made. Where there are two idling jets to be considered adjust one at a time. First turn one "in" until the engine starts stumbling, then "out" until it idles fastest. If "out" too far the engine will start to lope through indigestion. Don't force the idle screws against their seats. It is also a good plan to repeat the adjustment two or three times, just to be sure.

There is no external adjustment for the high speed jet but on carburetors using a metering rod to control the flow of gasoline to the high speed jet there are adjustments which should be left to the carburetor expert. Perhaps the tip of the rod is worn, calling for complete replacement. The acceleration system is in addition to the other jets and its efficiency depends on maintaining the plunger in good condition so that the well fully fills with the extra slug of gasoline which is shot into the mixing chamber when you step on the gas. Some carburetors have an adjustable arm for the pump, the shortest stroke being used for hot weather.

One of the common causes of engine stumbling is failure to appreciate the fact that the terms "idle" and "high speed" as applied to carburetor jets are somewhat misnomers. The idle jet may be the source of the engine's fuel up to 20 miles per hour or even higher, whereas the so-called high speed jet may come down to 20 mph. Thus if the idling mixture isn't right the engine may misbehave when running slowly in high. Poor blending of the two mixtures often accounts for a flat spot when the car's speed is around 20 mph. Here the engine is likely to jerk or act slug-

gish when accelerated so slowly that the acceleration pump fails to come into action. Stumbling of the engine on deceleration, however, may be due to trouble with the vacuum control of the distributor.

Air leakage in the vacuum windshield wiper line will lean the mixture and give a lot of trouble. Less obvious is leakage of the vacuum booster pump diaphragm part of the fuel pump. Here so much air leaks into the intake, along with oil drawn up from the crankcase, the engine won't idle properly and will run as roughly as with a stuck valve at low speeds in high gear. Another headache, ice in the carburetor, can be cured by using additives in the gas or by thoroughly warming up the engine before driving.

This brings us to the importance of checking with a vacuum gauge to make sure that what appears to be carburetion trouble isn't due to incorrect ignition timing, poor valving, stuck or worn piston rings, loose valve guides, weak valve springs, too close spark plug gaps, choked mufflers, leaky head gaskets or bad points. If the carburetor needs an adjustment the needle of a vacuum gauge will float slowly between a reading or 12 and 16 inches. If all is well the gauge should drop to 2 upon sudden opening of the throttle and snap back to 25.

It seems to be the lot of the carburetor designers to be called upon to find answers for many of the problems which come along with changing conditions and new designs. Emergency release of the throttle during high speed driving is one of these. To check the stalling which would follow overloading, engineers developed the slow-closing throttle. However, some cars did not have a throttle check until forced to by reason of the use of the torque converter which had a tendency to kill the engine during deceleration.

The economizer is one of the important features in efficient carburetion. It automatically adjusts the amount of air entering the high speed jet. Actually it is an air bleed. Somewhat similar results are had with the metering rod which meters the amount of gasoline flowing to the high speed jet. There are economy steps on the rod, the smallest cross-section of the pin being for the power step.

Because it is so important I have left to this point the relatively new business of cleaning the carburetor of gums, varnish, dyes and plain dirt without removing it from the car. This fits in with the new technique of on-the-car servicing. The fuel line to the carburetor is disconnected and a tube from a can of special detergent attached in place of it. When the contents of the can are run through the carburetor, with engine running, its passages and parts are ready again to work normally. •

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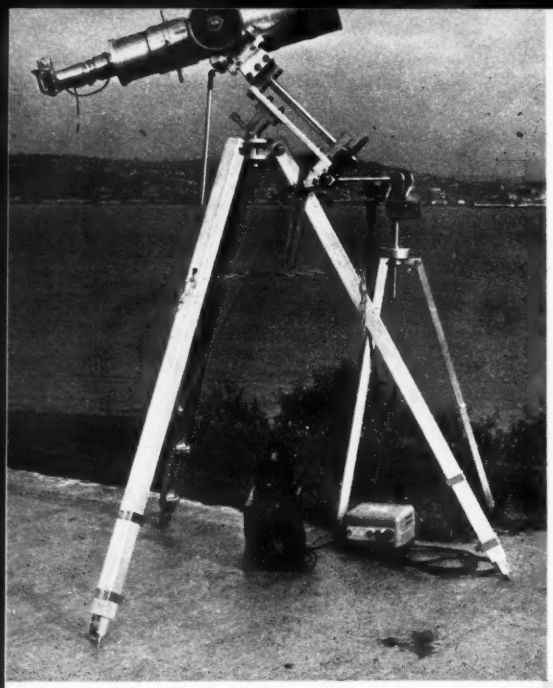


The Amateur Telescope Maker's Page

A Clock Drive

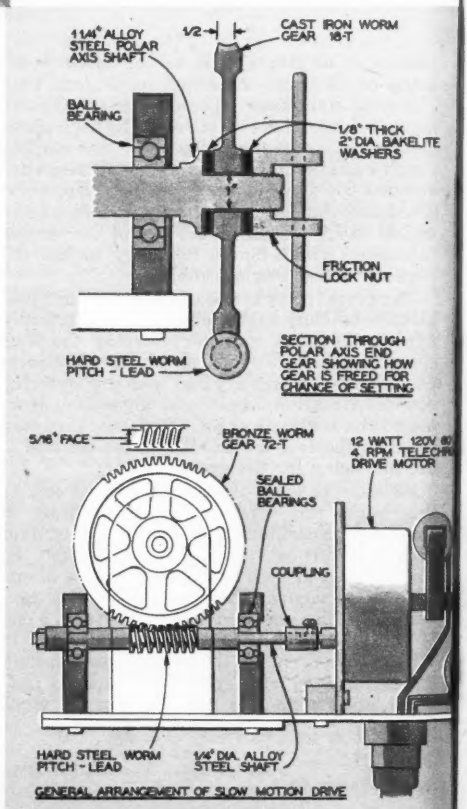
The clock-driven telescope made by W. C. Cheney of Seattle. The complete set-up includes a storage battery and an inverter to supply 60 cycle current for motor. Telescope will make one complete revolution in 24 hours. Drive unit is mounted separately to avoid transmitting vibration to telescope.

BUILDING a large telescope capable of serious celestial observation is indeed a measure of ability and perseverance. But, making a drive for it so that the telescope always follows a given star, without attention from the observer, that's indeed an accomplishment. Acceding to numerous requests for information on a clock-driven instrument, we present the work of Mr. W. C. Cheney, a torch manufacturer of Seattle, Wash.

The drive shaft from the power unit is connected to the worm on the scope and held by a tapered pin. This in turn drives the worm through a spring-loaded clutch. This clutch has two functions. It protects the power unit if the scope might become locked and it provides a means for hand correction while the power unit is in operation.

The gear which the worm drives is cast iron. It is lapped to the worm so there are no tight spots and no back lash. The gear drives the polar axis through a clutch. This clutch is used only to locate the scope on the object. The round nut with the bar through it is used to lock the clutch when the object is approximately located. The knob driving the worm is used for fine adjustment.

The polar axis to which the lower end of the large gear [*Continued on page* 190]



GENERAL ARRANGEMENT OF SLOW MOTION DRIVE

GEAR AND WORM FOR MANUAL RAISING AND LOWERING SCOPE

ADJUSTABLE COUNTERWEIGHT

SCOPE SADDLE (OR CRADLE)

POLAR AXIS FORK

POLAR AXIS BED PLATE

POLAR AXIS SHAFT

END GEAR AND LOCK 'CLUTCH' (SEE DETAIL)

TELECHRON ELECTRIC DRIVE UNIT

SLOW MOTION DRIVE UNIT (SEE DETAIL)

SEPARATE TRIPOD MOUNT ELIMINATES VIBRATION TRANSMISSION TO SCOPE

H. CLARK

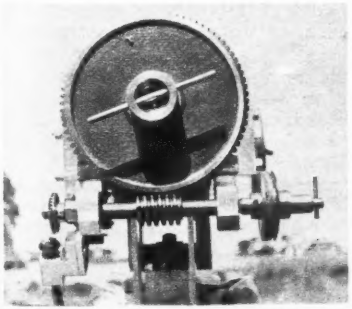
KNOB AND SHAFT FOR MANUAL AXIS ADJUSTMENT

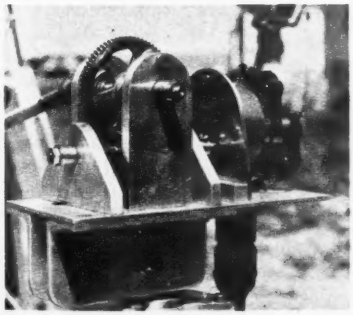
PINION ENGAGES BEVEL GEAR WHEN PUSHED IN

TRANSMISSION WORM GEAR

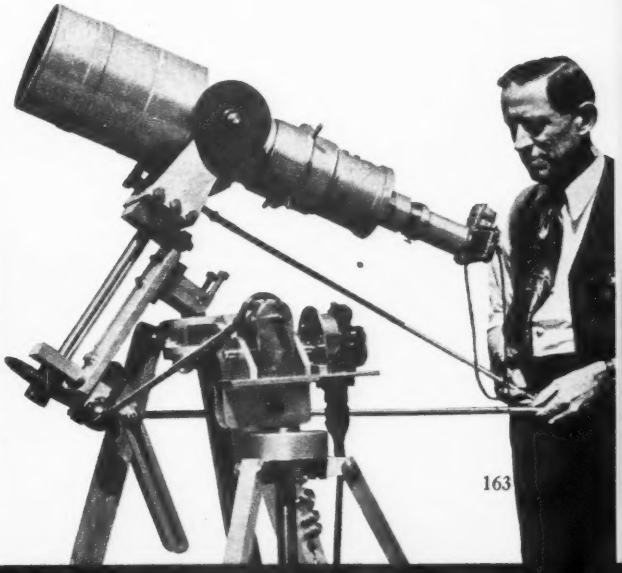
DRIVE SHAFT CAN BE TELESCOPED TO COMPENSATE FOR DISTANCE PLACING

SPRING LOADED CLUTCH PERMITS MANUAL ADJUSTING WITH POWER ON





The drive is powered by a 12-watt Telechron self-starting motor. It turns the shaft at four revolutions per minute. Sealed ball bearings are used throughout. Telescope is so delicately balanced that the weight of a match will cause the tube to turn when instrument is disconnected from the drive. Picture below shows Mr. Cheney at the controls of the telescope.



Build The PBY Catalina

[*Continued from page* 158]

Using a new piece of masking tape, mask off the top surface of the wing and paint it chrome yellow. The chevron and fuselage band are red Trim-Film while the cowls are painted bright red. Black Trim-Film is used for the wing, fuselage and empennage marking as well as the letters and numerals. Stars are red, white and blue Trim-Film.

Rub down the entire model with a good grade rubbing compound for a fine luster. This should be done after all paint has been applied and dried but before any decals have been applied. The entire plane should now receive two coats of a good fuel proofer. We have found "Tuff" fuel proofer to be one of the best and used it on our model. It is 100 per cent waterproof.

In order to obtain maximum flight efficiency we used two-bladed propellers (Cub 5-½ in. props cut down to 5 in diameter). The full scale Catalina used three-bladed propellers and these could be made by half-lapping propeller blades together and gluing them under pressure.

Check the balance of the model and be sure it balances as shown, correct with weight in the nose or tail. Landplane flying is quite conventional. However, a few words about seaplane flying may be in order. Stainless steel lines (.008 in.) are recommended because of their corrosion resistance. We flew our model on the enamel coated wires in our Jim Walker "Remoto" control handle and, on several occasions reeled in the lines while wet without any harmful results. Therefore if you do not already possess stainless steel lines the "Remoto" control handle-reel is the answer. This device also allows you to take off from a small diameter pond or field and, while flying, the lines can be lengthened and reeled back to allow a perfect landing on the take-off area. We found that 45-foot lines provided maximum enjoyment. When the model is released by your assistant, care should be taken by the flyer to keep the lines out of the water and also prevent the inboard float from diving into the water. This can be accomplished by constantly moving backwards slowly and gently until the craft is airborne. We fly from a pond that is about 18 in. deep. This depth allows the footwork that deeper water would hinder. It is suggested that the model be tested on land before water flying is attempted. If .099 engines are used and they are thoroughly broken in, it will be found that flight can be sustained on one engine with complete safety! If single engine flying is contemplated, we suggest that the inboard engine be used to insure taut lines. Happy flying! •

Model Roundhouse

[*Continued from page* 141]

1x4-in. and six 8 ft. lengths of 1x2-in. lumber will complete the requirements from the lumber yard for the frame. Make sure that the lumber is well seasoned and not warped. Having the lumber company cut the pieces to your exact measurements will save time and labor, as well as insuring a good fit at every joint. The hardware consists of 3-in. flat tees, 3-in. flat angles and 3-in. corners, plus No. 8 wood screws.

The first construction step is the forming of the 4x8 ft. outer frame from the 1x4-in. boards. Join each corner using an angle on the underside and a 3-in. angle inside the joint. Drill pilot holes for all the screws. A touch of soap on end of screws will save elbow grease.

Insert the cross members 12 in. apart, starting 20½ in. from either end. Use the angles and the 3 in. flat tees on each joint. Next complete the framework by adding three 1x2 in. members perpendicular to the cross members. This is done in order to give support to the roadbed as the track makes a full 180° turn at the end of the layout.

With the frame finished, the next step is track work. Rather than cover the layout with a top of plywood and leave only a little better than an inch to work with, use the "open frame" method of construction which will allow room for depth and realism to the scenery. The prime reason for using 1x2 in. cross members was to keep the track level well below the edge of the frame. The roadbed is Tru-Scale and on this is fastened Atlas flexible track.

Tru-Scale roadbed is milled of soft pine and comes in 3-ft. straight lengths as well as full circles ranging from 14 in. up to 22 in. radius (the largest that can be used on this layout). Switch blocks may be obtained from the same company for use in mounting the Atlas switches. The track is also made in 3-ft. lengths and may be curved to fit the roadbed. All of the terminals and freight or storage yards are built on ¼-in. plywood as this is the height of the roadbed.

The methods for fastening the roadbed to the frame cross members range all the way from cement and felt strips to wood screws and a cork liner. The felt and cork are used to reduce the noise. Use the screws to hold the roadbed to the frame and cement the track directly to the roadbed. If you spike the track to the roadbed and then screw the roadbed to the frame, the result will be a very noisy sounding board.

Next, the scenery. The methods and means of creating scenery between the tracks on our

[*Continued on page* 183]

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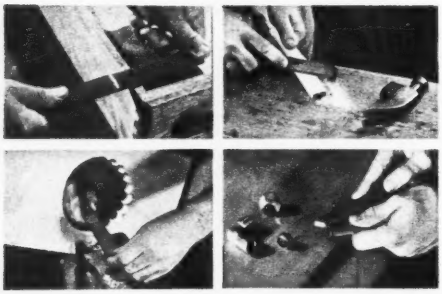

The rasp that outgrew its name

It was originally designed for shoemakers. And it's still *called* a "Shoe" Rasp. But with its four types of cutting surfaces, users have found it "as versatile as a multi-blade jackknife." You can use it on hundreds of jobs—on wood, metal, plastics, leather, etc. On flat, concave, or convex surfaces. It's practically—

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Paradise On Shoestring

[*Continued from page* 67]

Fairbanks. Natives told them the land was under BLM control so they put in for a small land tract lease. Today, with several hundred feet of their property fronting famed Richardson Highway adjoining the lake, they have their own homes plus a lodge where they are doing a flourishing business by offering such things as shower facilities for travelers, auto accessories, souvenirs, gas, oil, groceries and a dining room. Alaska residents are even getting to know Chuck and Bill's as a place to gather for winter sports. It's not the kind of glamour lodge you'll find in Sun Valley, but it's earning a living for two young pioneers who built on land they got for a song.

In case you've got an eye on Alaska yourself, there's still plenty of room for you. Approximately 290,000,000 acres of government-owned land up there remains to be appropriated. A good part of it, however, is being taken over by the Armed Forces.

But you can get BLM land in more than half of the 48 states. Here's how it all works:

Let's suppose BLM looks over its small land tract areas in Alabama and decides to lease and sell them to private American citizens.

What's the land good for? Well, that's what BLM wants to know, too. So it sends a land economist down to Alabama. His report will show just what part of the land is good for a vacation cabin, a permanent home, for a health convalescence, and even for a business site.

Once the land is classified, you can apply for a lease to a tract. If there are more tracts available than people wanting them, chances are you'll have no trouble getting your land—first come, first served. But in most cases, once word gets out that BLM has classified some land, just the reverse is true—more people apply than there are tracts available. Then your application is thrown into a "fish-bowl" and a drawing is held. It doesn't matter whether your application came in first, tenth or last, the land is given out according to the order in which lucky cards are drawn. Veterans, however, always get preference under the law when there is a drawing.

How fast does it work? On January 29, 1950, BLM announced it had classified and was ready to lease or sell small land tracts on one of those dream islands in the Florida Keys. This one was Sugar Loaf Key, 17 miles northeast of Key West. Applicants had only a month to file for 45 tracts averaging two acres each. But word somehow traveled so fast that exactly 1,670 applicants poured requests into BLM's office.

One GI stationed with the army of occupation in Germany, just to make sure he wouldn't

lose out, sent $200 in cash and said: "If I'm a winner, please use enclosed to pay for my land, sight unseen." Unfortunately, he was one of the unsuccessful candidates.

But winners included a doctor from Colorado and a teacher from the Bronx, a lawyer from Washington, D. C., a social worker from Minneapolis, a farm hand from upstate New York and a machinist from a small town in Michigan. All were notified of their good luck within 60 days after the original announcement was made and all got options to buy the land at prices ranging from $25 to $170, depending on location. Meanwhile, their rent is $5 a year under leases running from one to five years.

Actually, despite the tremendous growing demand, BLM doesn't have the manpower or the money to classify most of the small tract land it controls. When it does classify land, therefore, it sets machinery in motion to give everyone an equal chance to get in on a drawing. In most cases, word spreads because it's announced in the local newspapers of the areas in which land is being opened. Sometimes it starts through people who know about the BLM and keep in touch with developments by writing an occasional letter to one of BLM's regional land offices. They simply ask: "Has any land been classified in your area?"

You can do this too. For example, if you are interested in land around Nevada or California, you could write to one of the regional land directors in Los Angeles.

However, for a complete list of all regional land directors and the land they control, plus the most recent official explanation of the whole BLM deal, you should write to the Bureau of Land Management, Department of Interior, Washington 25, D. C., and ask for the bulletin called *Facts on Small Tracts.*

But the best way to be the first to know about land classification, according to BLM officials in Washington, is to check a little-known publication called the Federal Register. The Register is the government's chronicle of daily happenings in Washington. Notice of land classifications must appear first and always in the Federal Register which is available in most public and university libraries, in many government offices and even can be bought on subscription through the Superintendent of Documents, Government Printing Office, Washington, D. C.

Here's another tip. You don't have to wait for land to be classified. If you find out from one of BLM's regional land offices just where small land tracts are located, you can go on a land hunt of your own, single out a specific piece of property and apply to have it classi-

[*Continued on page* 172]

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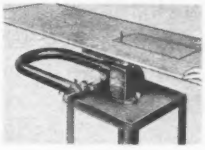

LOOK!

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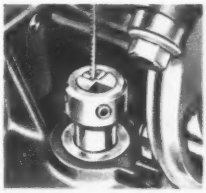

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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Facts On Keeping Warm

[*Continued from page* 73]

same time that the leather permits air to circulate freely around the foot, thus evaporating excess perspiration.

3. One of the biggest problems in cold weather is to keep your hands warm. A heavy pair of fleece or wool-lined gloves feels fine when you draw them on and step out the door but after you've been outside a spell you are surprised to find your fingers getting numb despite the bulky coverings. Here is the solution: wear a thin, woolen pair and cover them with another pair of loose leather or wool. Remember the dead air rule? It will work here too.

4. The more completely you cover your head, the warmer you'll feel in shivering weather. You see, blood rushes to your head in the cold and body heat goes scampering off. Bottle it up with a hat and ear muffs.

5. Use gadgets. There are some on the market now, although not as many as there should be. (Tip to inventors: whip up a unique new contraption and you'll find plenty of persons interested. Retail store owners to whom I spoke told me that nothing new has come along in the field for several seasons.)

Here are a couple: a Thermat Heat Pad, developed by Bauer and Black, is a portable heating pad, seven by seven inches, which can be carried around and used anywhere. An inner canvas bag contains powdered iron oxide and sand. All you do is add a couple of spoonfuls of water which set up a chemical reaction resulting in heat for six to eight hours. The packet can be reused five to eight times, after which filler can be bought. The gadget costs $1.98 and filler 85 cents.

Pocket hand warmers in the shape of small flasks are back on the market. They contain wadding just like cigarette lighters and you simply fill them with lighter fluid or benzene, ignite an asbestos burner, wait a moment, blow out the flame and put them in your pocket. They stay warm for hours. Cost is about $2.50.

There are lots of other things you should know about handling yourself in the cold. For example, how do you keep warm—your feet especially—while you are standing in an unprotected spot waiting for a bus which has been delayed by slippery streets? The answer: move, brother, move. Keep jiggling your joints constantly, shoulders, fingers, knees, toes. Keep moving your toes inside your shoes, mark time in place, twitch your muscles. Not after you get cold, but *before* you get cold. This is prevention.

Suppose you're faced with a case of frostbite? Do you rub the affected part with snow, as you may have seen in movies or heard

[*Continued on page* 170]

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Cold Facts On Keeping Warm

[*Continued from page* 168]

somewhere? You do not! It's an old wives' tale and you'd do well to forget it. Rubbing a frost-bitten area with anything will break the tissues and cause wounds which may be serious. The correct first aid measure, according to the Red Cross, is to apply a cold compress—an ice bag or a cloth wrung out in cold water—for 20 minutes, remove it for the same length of time and apply again until medical aid arrives.

What's the best way of warming up after you've been out in the chill of winter? Sorry, but we've got to explode another cherished notion. In movies and novels, Sir Basil opens the door of his hunting lodge, admits a half-frozen wayfarer and immediately pours him a tumbler full of whisky. Both the Red Cross and Dr. Lemons of the QM environmental protection section agree that alcohol is a poor method of rewarming a man suffering from exposure to the cold.

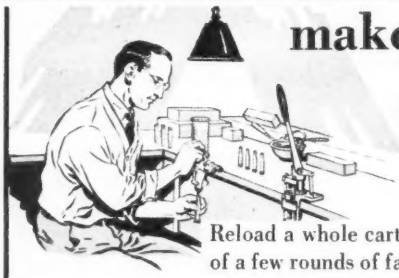
"It acts chiefly as an anesthetic," says Dr. Lemons, "making the man feel warm and comfortable even though he is not." The Red Cross feels that alcohol has a depressing effect on body activities. A much better way of rewarming is exercise; the next best is a hot drink. A good tip at home is to come into a cool room and gradually raise the temperature so that the body will have a chance of catching up.

Amazing experiments are being carried out at the unique Climatic Research Laboratory, the only military installation of its kind in the U. S. QM operated in Lawrence, Mass.

Hero of the lab is an amazing soldier, one Chauncey Smythe Depew, who has done more to help GI's fight climate—and help you, too—than any other single individual. Chauncey is the chief tester at the lab. He stands for days in blistering cold and sweating heat.

Chauncey is made of copper. He is a hollow shell fitted with a maze of electrical gadgets and sensitive chemical apparatus which make his "skin" respond to different weather conditions just as does human flesh. He is dressed in the latest QM garb, subjected to heat or cold, and registers how he is feeling through a series of electrical circuits which can show how rapidly his body loses heat under all climatic conditions.

But you yourself are concerned about that buffeting north wind right now. Just remember this: clothes make the man but science has now modified the time-worn adage just a bit. Wear them correctly, and they'll make the man—warmer! •



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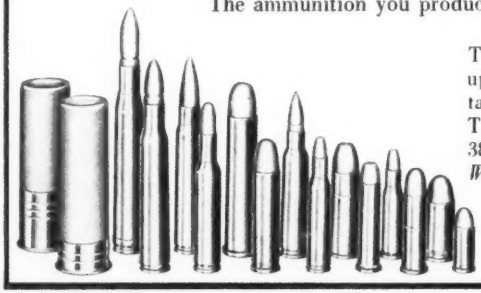

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Free booklet on request.

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MI Tests The '52 Lincoln

[*Continued from page 89*]

matic took 14.8 using Low and High, hardly any difference. A 1952 Lincoln with overdrive averaged 14.1 seconds—and this is the transmission they may drop.

Frankly, this was a frustrating car for me to test. It had everything—almost. The Capri hardtop is a really sporty looking number. (But Henry, that engine—it's too small!) This is one of the finest handling big American cars I have ever driven and in the luxury and comfort departments I found it unbeatable. On the S bends of the Ford high speed track where I made my tests, this car held the turns like a leech. It was a true pleasure to steer. This is undoubtedly one of the finest American cars ever built. (But Henry—that engine!) It also is the first of the new rigs I've driven that had me wondering how I would hop it up before I had driven it five miles. The bore is 3⅛ and the stroke 3½. Chrysler and Caddie at this writing sport the same dimensions at 3$\frac{13}{16}$ and 3⅝, just a little bigger. But how that little difference adds up!

With just a little here and a mite there, the new Lincoln could be a wildcat and I hope to be able to report in the round-up in the December issue of 1952 that the new job, slightly changed, finally put itself up in front with Chrysler and Caddie in the performance department. In style, comfort and luxury, it is a magnificent automobile right now. •

SPECIFICATIONS

MODEL TESTED:

1952 Lincoln hardtop convertibles (with Hydra-matic and with overdrive)

ENGINE:

V8 cylinder, OHV; bore 3⅛ inches, stroke 3½ inches; maximum torque 284 foot pounds @ 1800 rpm; brake horsepower 160 @ 3900 rpm; compression ratio 7.5 to 1

DIMENSIONS:

Wheelbase 123 inches; overall length 214.1 inches; tread 58.5 inches front, 58.5 rear; width 76.2 inches; height 62.9 inches; weight 4,000 pounds; standard tire size 8.00x15; gas tank 21 gals

PERFORMANCE:

	Hydra-matic	Overdrive
0 to 30 mph,	5.3 seconds	4.3 seconds
0 to 50 mph,	10.8 seconds	9.9 seconds
0 to 60 mph,	14.1 seconds	14.1 seconds
0 to 70 mph,	20.4 seconds	17.6 seconds
0 to 80 mph,	27.1 seconds	23.9 seconds

Half-mile from standing start, 31.4 seconds (overdrive car)

Top speed, 100-102 mph with overdrive, 98 with Hydra-matic

SPEEDOMETER ERROR:

At 60 mph on speedometer, actual speed 59.21 mph with overdrive, 58.82 with Hydra-matic

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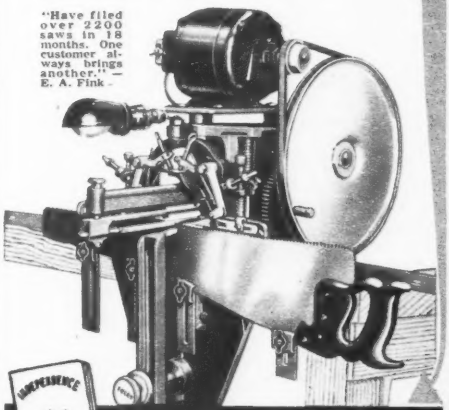

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Paradise On A Shoestring

[*Continued from page* 167]

fied. In fact, BLM officials say this is probably the best way you can be sure of getting the land you want because when it is classified it's all yours. Even if there should be a drawing, you get absolute priority whether you're a veteran or not. The BLM figures you've earned it if you're willing to do your own land searching.

Sometimes a request to classify land for one individual opens up the entire area to dozens of others. Last spring, Hector A. Smith went on a land hunt in Alabama. He first got in touch with the regional land officer and learned that BLM owned more than 100 acres of small tract land on a narrow neck between Bon Secours Bay and the Gulf of Mexico within a stone's throw of the slick Dixie Graves Parkway. He applied to have five acres classified for himself. Right after that, 676 applicants asked to be included. That meant another land drawing. Of 90 tracts awarded within a month, there were only 89 winners because the first tract had to go to Smith.

In most cases, land classified for homesite use only cannot be used for anything else. But many shrewd land hunters know that once the land is bought after they execute option, it's their own to do with as they please.

An ex-newspaperman who leased five acres of Florida land for convalescent purposes, bought the tract under his option, made a complete recovery and set himself up in a successful tourist-camp business. A couple from Delaware got a lease on Nevada desert land for a vacation site. Then, after paying $85 for three acres near a highway, established a thriving refreshment stand alongside a permanent home of their own. They happen to like the desert.

But if you're ever on Florida's U. S. Highway 98, between Panama City and Tallahassee, you're bound to catch a glimpse of a tourist camp and restaurant business easily worth $100,000. The owner is a former Army officer who wanted to start a new life for his family. You guessed it—he got the land for a song from the BLM.

Of course, you may not want to run a tourist camp or a desert restaurant. But with Uncle Sam holding the deed to nearly one-half million acres of public land, you certainly ought to find one piece of choice property in time to pitch a tent for your next vacation. •

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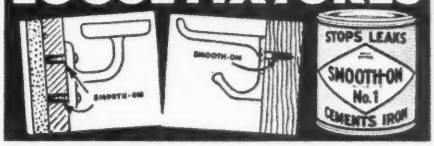

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Portable Belt Sander

[*Continued from page* 108]

light bulb will quickly determine your line voltage. The switch must be in the off position before the cord is attached to the outlet. Protect yourself from dust at all times by wearing a respirator. Only the more expensive, production-work machines come equipped with vacuum dust-collecting bags.

No pressure is necessary, as the weight of the machine is sufficient. The sander should be held off the work when starting and stopping to avoid stretching the chain or burning out the switch. The sanding shoe must be held flat on the work and a firm grip should be maintained on the handle at all times.

If the machine has only a two-wire cord, a third wire should be connected from the frame of the machine to a "ground." This is a safety factor that will protect you from a possible shock in case of motor trouble. Many of the modern machines are equipped with this third wire, usually colored green or red.

These sanders are usually provided with a universal type of motor which will run on direct or alternating current from 25 to 60 cycles, single phase 115 of 220 volts. If this single-phase machine is to be operated on a two- or three-phase line, special connections are necessary as only two wires (plus a ground when provided) are required in connecting a universal or single phase motor to any line. On a three-phase line, generally 220 volts, use any two of the three wires for 220 volt, 60 cycle, one-phase current. On a two-phase power line with four wires, you must make sure to use the correct two of the four for 220 volt, 60 cycle, one phase. In wiring to a standard home single phase three-wire circuit, connect either one of the outside wires and the center wire for 110 volts. If the machine is rated for 220 volts, connect the two outside wires. If you are not thoroughly familiar with electricity or if local codes prohibit these modifications, call an electrician.

The motor is cooled by a fan that draws in air around the commutator and expells it through holes in other parts of the frame. It stands to reason that if these holes are permitted to fill with dust and dirt, the fan cannot do the job for which it was designed.

Brushes do wear from rubbing against the commutator and consequently should be replaced when worn down. They should move freely to make good contact with a clean, smooth commutator. Use fine sandpaper (never emery cloth) on the commutator unless it is badly worn or grooved. In this case it must be turned down on the lathe, preferably at an authorized service station.

This little work horse is subjected to a

tremendous amount of labor for its size. Lubrication is very important. The motor bearings should be kept constantly supplied with grease or oil but should never be overlubricated, as your lubricating agent will be forced out and onto the commutator.

The chain runs through a special grease that is packed in the chamber until it is about half full. This grease should not need replacing for about six months.

The worm gear will wear out very rapidly if ever permitted to run dry. The chamber should be inspected at least every two weeks to be certain that the grease is up to the level recommended by the manufacturer.

Success is assured, even for the beginner, by following these steps in using a portable belt sander: First of all, be sure to place your sanding belt on the machine in the correct position. An arrow printed on the inside of each belt indicates the proper direction. Adjust the tension and alignment after changing belts to make sure that they will run true in the center of the pulleys.

Before plugging in your cord, make sure that the switch is in the off position. The machine should not be rested on your work when you turn the switch on. Instead, hold it firmly once the power is on, and lower it slowly onto your surface. Hold the handle firmly at all times. You'll find, when sanding, that the weight of the sander offers sufficient pressure. Don't press down on it, as this extra stress tends to overload the motor.

Keep the sander in motion constantly. If it is permitted to remain in one area, it will produce an uneven surface. For rapidly smoothing rough work, the machine may be operated diagonally across the grain at first, and finally with the grain.

You may find it convenient to drape the cord over your shoulder in order to divert the tension on it from the machine, and also to prevent it from getting caught in the belt. If an extension cord is used, it should be at least 14-gauge wire for lengths up to 50 feet, and 12-gauge wire from 50 to 100 feet.

Despite the amazing performance of the belt sander, a small amount of hand sanding is advisable for really fine work like cabinetry, furniture, etc. You can readily detect any flaws in your surface by running your fingertips over the work lightly. •

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Combine practicality and security by engaging in this two-in-one project which includes a double garage and a sturdy concrete shelter built into one corner. Shelter may be used for storage or as tool room. For your copy of the complete plans which include diagrams and full instructions, remit $1.00 to *Mechanix Illustrated* Plans Service, Fawcett Building, Greenwich, Conn. Plan No. HJ-18.

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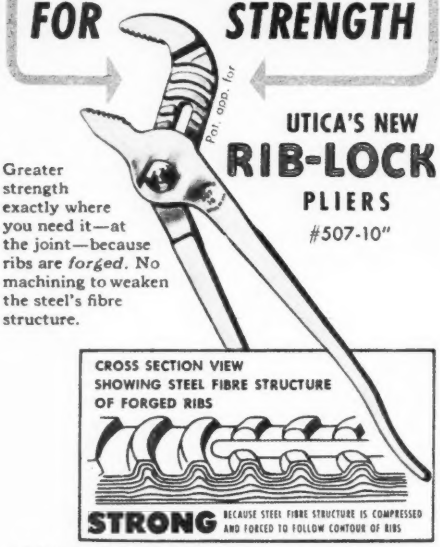

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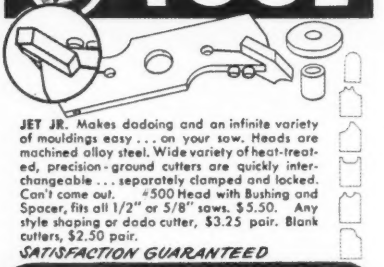

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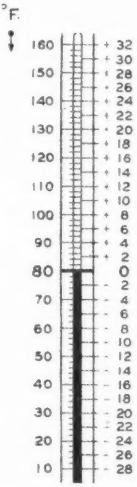
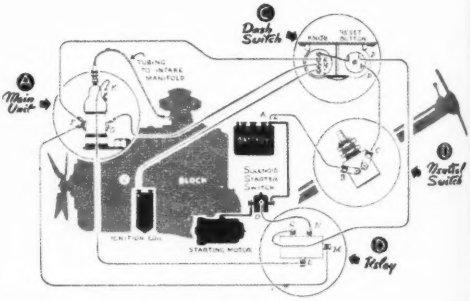


Redi-Warm (see sketch below) is an automatic device designed to keep your car's engine warm regardless of external weather conditions. The mechanism, through thermostatic control, periodically starts the motor so that the engine can keep itself warm. It automatically shuts off ignition when engine has been warmed up.



Main unit of Redi-Warm (see text) is attached as shown. Switch (B) clamps to steering post, switch (C) is mounted on dash. It is manufactured by the Cray-Lincoln Manufacturing Co., North Walpole, N. H.

Special Paints

[*Continued from page* 128]

development. Old beaten leather chairs take on a new appearance when given a coat of Jenkins Leather Renewer. Tears and rips patched up with adhesive or Scotch tape can be covered with a few coats of paint and the seam is almost invisible.

Window screens, a must in almost all households, take a terrible beating from summer rains and humidity. Under certain conditions they can rust in long dark streaks that stain the outside paint. A new screen enamel such as Carmôte will prevent this. It's available in colors for decorating effects and won't clog the pores of the screen when it's applied.

One of Grandma's remedies that modern housewives still swear by is the time-honored cedar chest for out-of-season clothing storage. Although today's housewife banks on the additional protection of chemical mothproofing, she still feels safer if the clothes are stored in a cedar chest. But here the cost factor enters. Cedar chests are expensive. However, paint again comes to the rescue. Applied with a brush, sprayed or troweled on, Cedar-Lux converts any trunk, box or chest into a safe, fragrant cedar storage unit.

On the nation's highways, paint is helping to cut the staggering death toll in traffic accidents. The familiar highway department truck painting the white center and traffic control lines has far fewer repeat calls today. The white line now is a special paint called Nitelite in which millions of tiny glass beads are imbedded. They catch and reflect headlights to make a long-lasting stripe that fairly screams for attention. For the average motorist it adds up to greater safety and ease in driving.

Strangely enough, one of the simplest problems took the longest time to solve. Decorators, homeowners and directors of such institutions as hospitals, schools and restaurants have long besieged the paint companies with requests for an odorless paint. For fifteen years, research staffs labored. The closest they came to a solution was a material that masked the normal paint smell with an even stronger odor. This, howled the public, was not a solution. Finally the scientists developed a process of actually removing the odor in manufacturing. No more covering up a bad smell with another one. This new paint just didn't smell. The public's acceptance of Pierce, Keystone and Sapolin's odorless paints has justified the many years of research.

"I painted my aluminum garden chair last

[*Continued on page* 179]

Feature for feature . . .

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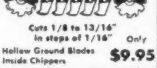

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Special Paints

[*Continued from page* 177]

week. Now the paint is chipping. Your paint is a gyp and I want my money back." Paint manufacturers still shudder when they glance over bulging files of customer complaints along this line. Until recently the only thing they could do was work up a form letter explaining that they were sorry, but aluminum just won't take paint. Now, with a sigh of relief, they can answer the angry yelps. X-I-M Flash Bond, used as an undercoat will bond paints to many surfaces formerly rated impossible: brass, glass and aluminum.

For the homeowner anxious to conserve his strength, there's a new paint guaranteed to reduce the need for elbow grease. It eliminates the necessity for time-consuming scraping when preparing a badly rusted surface for painting. With TremClad Rust Paint it's safe to paint right over the rust. Available in black or aluminum, it adheres perfectly and gives protection in only one coat.

"Son, go out and get me a bucket of polka dot paint." This used to be a favorite gag of painters to fool unwary apprentices. It was a standard, along with left-handed monkey wrenches. Today, the apprentice can have the last laugh. Plextone actually enables a painter to spray two or more colors on one surface at the same time. The colors don't emerge or blend, but exist separately creating an interlacing color network, which at a slight distance is extremely pleasing.

The sad sack at any of his own parties used to be Joe Jinks, the home workshop fan who built the beautiful cocktail table on which all his guests were depositing their liquor glasses. Instead of downing a few with his chums, Joe got red-eyed thinking of all the work he'd have stripping off the ring-marked finish on his table, and then resurfacing it. But no more! He coated the table with Cosmo Spar, an amazing new finish that is resistant to everything from alcohol to horses' hoofs.

And on and on goes the list of developed products to make living simpler and easier. Latest innovations include a DDT paint, a chalking outside white that cleans itself every time it rains, a paint that gives a hand-rubbed and waxed effect, a paint for rugs, a paint that makes furniture look antique in a matter of seconds—and many others.

The search for more and better paints goes on. Certainly the future will conjure up products even more amazing. Meanwhile we are all benefitting from special paints developed to solve specific home problems.

Names and addresses of specialty paint manufacturers will be sent upon receipt of a stamped self-addressed envelope. •

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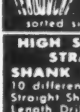

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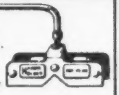

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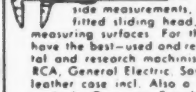

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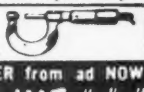

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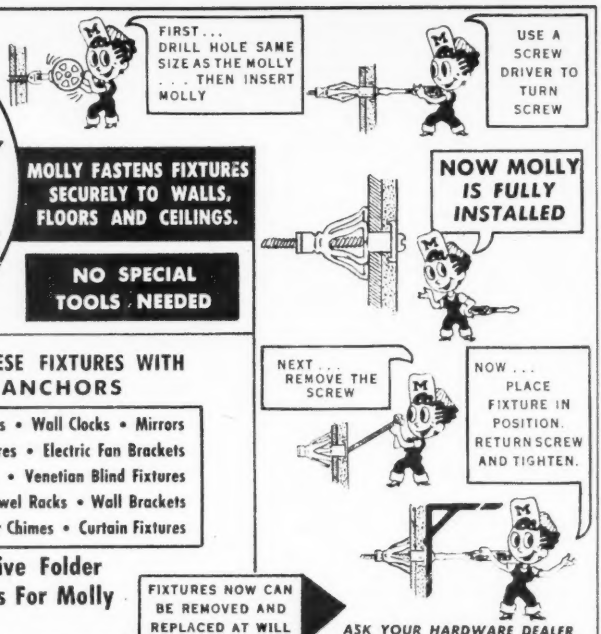

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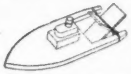

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Model Roundhouse

[*Continued from page* 164]

layout are many and varied. While plaster over a fine mesh screen is wonderful on an anchored or permanent layout, it will add quite a bit of weight to the portable layout and as the finished product is not very flexible it tends to crack. Heavy brown wrapping paper will save weight and a few artful touches of a paint brush will transform the paper into rolling farm land or a parched desert with stones, sand and bleaching bones. The actual details of scenery are limited only by your imagination.

The complete project is only four inches high, when placed on its side against a wall of the room, and takes up very little space. Since the tracks and scenery are well below the edge of the layout, there is nothing to mar the wall and if a few strips of felt are cemented to edge of frame, no damage will be done.

Now that the layout is finished, we had better hide it if we are going to keep it in the living room and keep peace in the house at the same time. There are quite a few ways to do this and one of the best that I have seen was done by a friend of mine. After his wife had hung an eight foot wide valance and drapery on a blank wall, he put hooks on the wall, behind the drapes and hung the layout there.

I have found that for the best operating and viewing results, the layout should be about 40 in. above the floor. A good support for the layout is a pair of horses fastened with demountable Thomas Nu-Way sawhorse brackets. •

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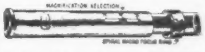

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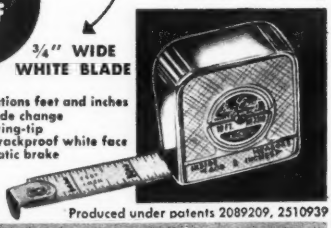

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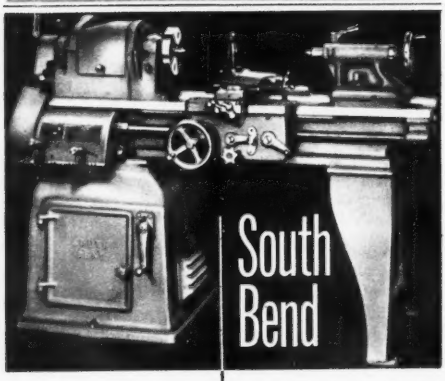

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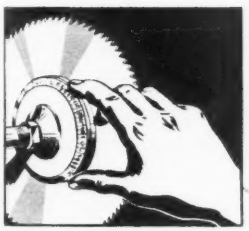

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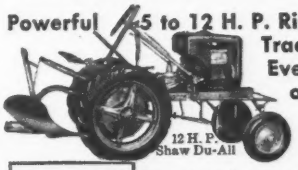

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Telescope Maker's Page

[*Continued from page* 162]

is attached is machined from a piece of 1½ in. alloy steel. It is supported by two annular ball bearings, which in turn are mounted on a frame of dural plates.

The fork is fabricated from 1x5 in. hard dural plane and very accurately machined. This fork supports two parts of the scope mount. The scope cradle rests between the forks. The cradle is supported by two studs which screw into the arms of the cradle and pass through the arms of the fork. These studs extend beyond the fork arms, one of which carries the counterweight. Counterweight may be moved in or out from the fork arm for balancing. •

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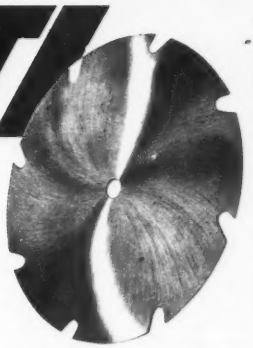
Where Amateur Telescope Making Started

PTI



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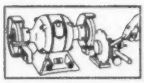

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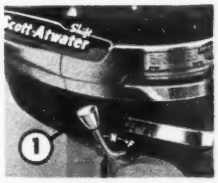

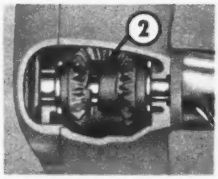

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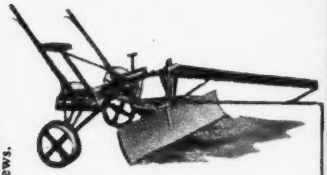
DO YOUR OWN WELDING EARN WHILE YOU SAVE ON REPAIRS!

W. H. Schlafke, Jewell, Iowa, mounts his LeJay Welder on tractor by an easily removed frame held by set screws.



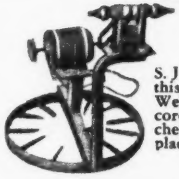
T. F. Waller, Circle, Mont., won first prize in our recent welders' contest with this grader and terracer made at "very low cost" with a Model 200 LeJay Welder.

Wilfrid Wassenberg, Marysville, Kansas, loads up to 240 bales hourly with this bale loader. His LeJay Welder is driven by a Model A Ford engine.

Robert Anderson, Winnebago, Minn., fabricated this steel trailer with his LeJay Welder. "I have welded car fenders, cast iron, steel, aluminum, bronze . . . have used it continuously all day . . . with very little amperage drop."

Ray Burton, Chicago Heights, Ill., built this Army "Jeep" with his portable LeJay Welder. A Clinton 2.9 H.P. motor propels it at 10 M.P.H. in third gear.

Heavy duty utility hoist also made by Wassenberg with his LeJay Welder. Capacity is 1500 lbs.



S. J. Sedlacek, Barnes, Kansas, built this portable grinder with his LeJay Welder for "on the job" use. According to Sedlacek, ". . . it's the cheapest piece of machinery on the place."

COMPARE THIS!! 250 AMP. D.C. WELDER KIT— $39.95

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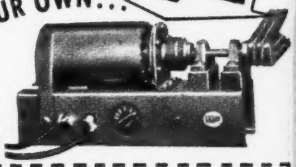

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PAY FOR YOUR WELDER... BY WELDING FOR OTHERS!

NOW, at a fraction of its original cost, you can make your own welder using any aircraft generator. You can not only save money, but a few repair jobs for your friends will quickly pay for your welder. Only a pair of pliers and a few minutes are needed to assemble this kit into a sturdy welder giving you many years of useful service—with satisfaction guaranteed.

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No. AW5-Kit includes these ten parts: (1) special hook-up leads (2) amperage control with leads (3) Hi-Lo switch (4) mounting plate (5) pillow bearings (6) bearing supports (7) shaft extension (8) flexible coupling splined to fit your generator (9) triple groove "B" type pulley (10) complete assembly plan.

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Now! Spot Your TV Trouble at a Glance... *and see how to fix it, fast.*

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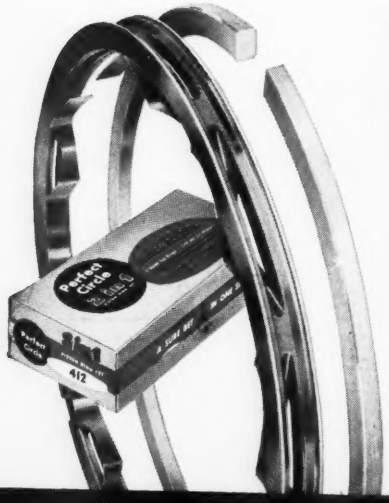

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